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FLIGHT

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SEPTEMBER 2nd, 1943

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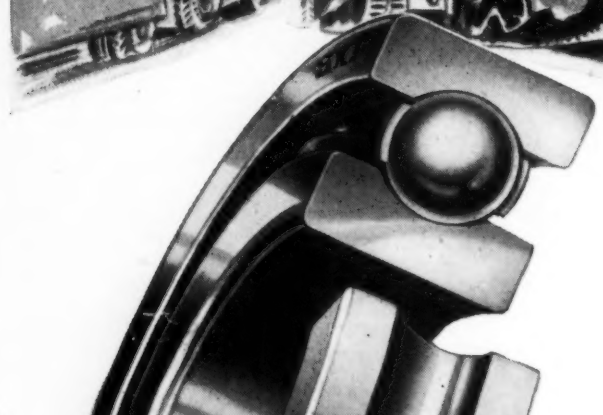
REMEMBER . . . . . THE ALDERSHOT TATTOO ?



Very different are the tanks of to-day from those that rumbled across Rushbrook Arena. The engineering brains which to-day are keyed to winning the war, to-morrow will be working to win the peace; Skefko along with them.

REMEMBER

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FLIGHT and The AIRCRAFT ENGINEER

First Aeronautical Weekly in the World : Founded 1909

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The Outlook

Cracking ?

ALL through the inter-war years German propagandists were busily setting abroad the theory that the German Army was never defeated but that the home front crumbled behind it, and that it was that crumbling which led to the surrender and the signing of the Armistice. Certainly the home front was in a bad way by then, but it is a hard fact that the Armistice was the direct result of the hammer blows dealt by Marshal Foch and Lord Haig. The German Army was beaten fairly and squarely in a series of battles, and if it had not been so beaten the cracking of the home front would never have led to surrender. As the saying goes, "The Army is Germany, and Germany is the Army." From that point of view the *Luftwaffe*, although organised as an independent Service, is doubtless regarded by the German people as part of the Army.

The summer now drawing to a close has seen a number of defeats for the German Army as well as for the *Luftwaffe*. In Tunisia, in Sicily, and at various parts of the Russian front, heavy military defeats have been suffered by German arms. These defeats created the situation in which a crack of the home front might be expected. Evidence that the process has begun may be found in the appointment of Himmler as Minister of the Interior. Dr. Goebbels has proved incapable of bolstering up public *morale*, and so the jack-boot of the greatest bully in Europe is to take the place of the wheedling distortions of the ingenious Doctor.

It is when public opinion is in this state of depression that air raids create the greatest shock. The German public will bear up against much when their armies are advancing and winning, but when the news from the front is depressing the people feel their own sufferings most keenly. Doubtless these considerations prompted the British High Command to order Bomber Command to seize the first favourable opportunity to strike hard at Berlin. The preparations must have been in train well before the appointment of Himmler was announced, for our authorities are well informed.

Berlin is a military target of no small importance, but it is also a nerve centre. Bombs which are only aimed at railway stations have a telling effect on the spirits of the people who crowd into the shelters. For several nights running small parties of Mosquitoes kept Berlin on edge, and then came the crashing blow of 1,700 tons of bombs.

German fighters might take their toll of the raiders, but they could not protect the capital from the bombs. On following nights more Mosquitoes set the sirens blowing again. Himmler will need his heaviest pair of boots to keep the spirits of Berliners up to the desired scratch.

Quebec and Japan

THE uneasy feelings aroused by the absence of a Russian representative at the Quebec Conference have been largely dissipated by the official statement that "the military discussions of the Chiefs of Staff turned very largely on the war against Japan and the bringing of effective aid to China." Russia is not at war with Japan, and therefore could not take part in such discussions. Moreover, everybody in the United Nations, and no doubt everybody in Germany and Italy as well, is expecting an invasion of the Continent any day now, which will bring substantial relief to the Russian Army. To send help to China is a more complicated task. It means, in the first place, the reconquest of Burma and the opening of the road from Lashio, which may be undertaken soon when the monsoon is over.

Thoughts tend to turn very much to the possibilities

of bombing the mainland of Nippon. The results of bombing by itself might be disappointing.

The situation is governed by the Japanese fleet. The Japanese forces in all the occupied lands and islands depend for their communications and supplies on the strength of that fleet. It has never ventured forth in full strength to oppose the steady advance of General MacArthur's forces, perhaps because it has conceived a great respect for his shore-based aircraft, and it may have lost confidence in the ability of its own carriers to protect the capital ships from air attack. But when a mighty British and American fleet, strong in battleships and carriers as well as all other classes of warships, advances into the Pacific, the Japanese fleet must accept the challenge or admit that the game is up.

After Four Years

SEPTEMBER 3rd is a day which invites us to look both back and forwards. In the four years of war the air power of the British Empire has seen many changes. The first blow struck at the enemy was the gallant little raid, mainly by Blenheims of Bomber Command, on ships off Wilhelmshaven and Brunsbüttel. Then came months in which Coastal Command provided all the air news, followed by the dolorous stories of self-sacrificing Gladiators and Hurricanes in Norway and the puny Air Force sent with the Army to France.

Then came the epics of Dunkerque, the Battle of Britain, and the blitz on our cities by night, in which day-fighters proved their superiority, and night-fighters were feeling their way to power.

Suddenly the centre of interest switched to the Mediterranean, where the Middle East Command asserted an easy superiority over the *Regia Aeronautica*. Greece was another tragedy, and Crete remains a unique example of what can happen when a defending force has no fighter cover. More lessons were to be learnt when General Auchinleck's Army was driven back, although he held superiority in the air; and still more when the advance of General Montgomery showed that proper co-ordination of ground and air had been achieved. Bombers failed to reduce Malta as they had failed over Britain.

More tragedies took place in the Pacific, where the absence of fighter cover lost us two capital ships. Australia seemed in danger, but General MacArthur held the enemy at arm's length with his bombers.

Meanwhile Bomber Command built up a great array of four-engined bombers and commenced a mighty offensive against German production. Coastal Command and the Navy together have reduced the U-boat danger. And so we enter the fifth year of the war in very good heart.

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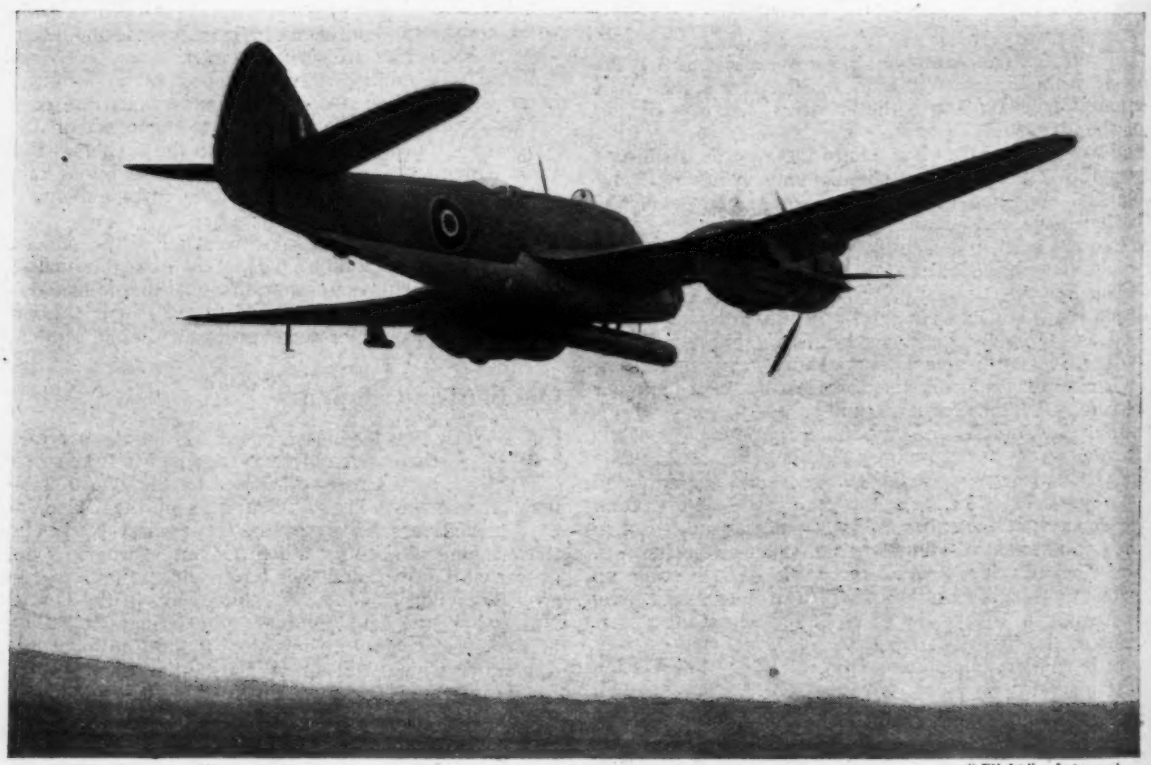


"Flight" photograph.

CONFIDENCE: A Bristol test pilot showing the ability of the torpedo Beaufighter to fly at zero altitude with one Hercules engine stopped and its De Havilland airscrew feathered. An illustrated article on this machine appears on pp. 253-255 of this issue.

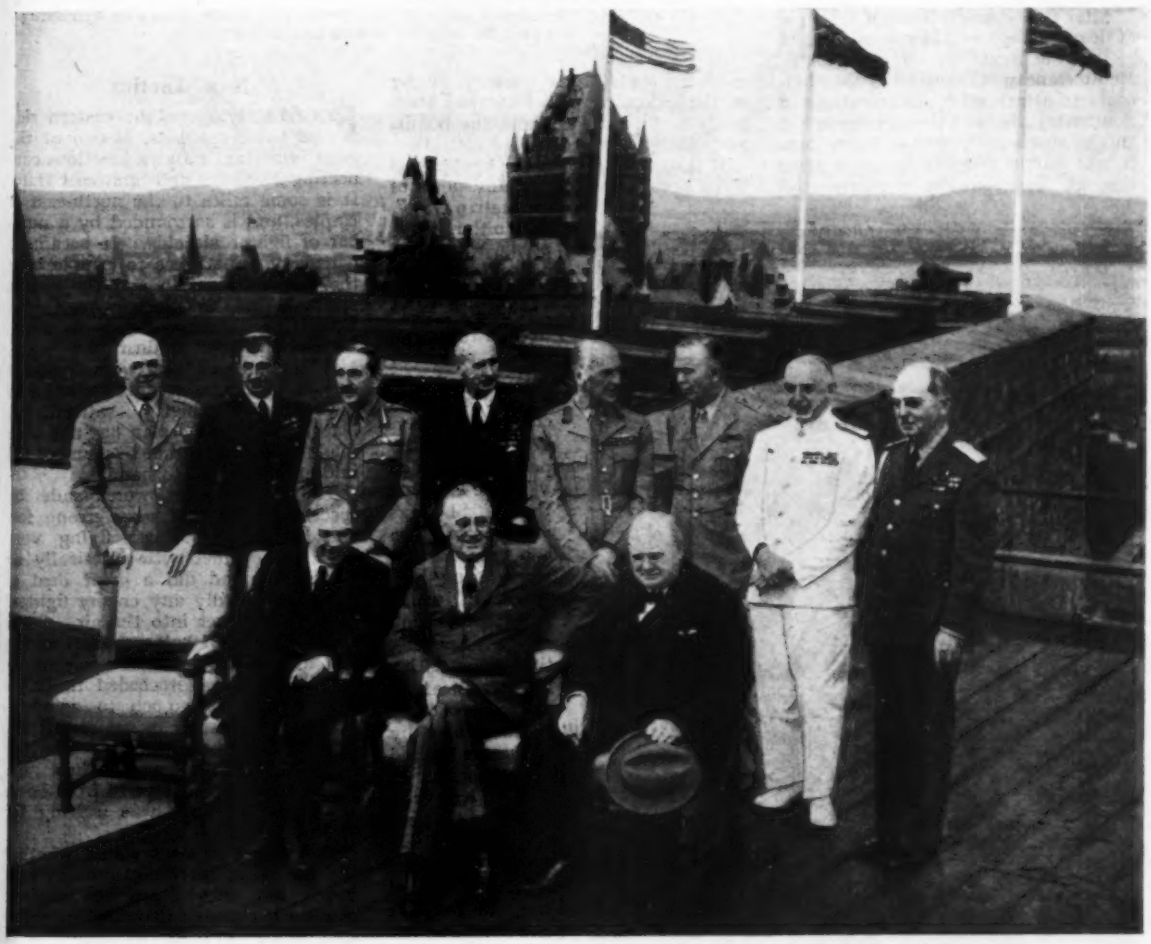
WAR in the AIR

German Fighters in Italy : Italian Cruiser Bombed : Foggia Airfields : Aircraft in Russia

THE Germans have shown uncertainty as to the amount they would risk in the defence of southern Italy. For a while the Allied aircraft found no hostile machines in the skies, and bombed railway junctions at their will. Then, on certain days, fairly strong forces of enemy bombers were met, but they were unable to hold off the British and Americans. Then again came days without an enemy fighter to be seen in the air. This undecided policy did no good in saving the Italian communications, but cost the enemy a number of fighters which he obviously cannot now well afford.

Perhaps this blowing hot and cold about the decision to use fighters on the jobs for which they were intended or to save them at the sacrifice of the ground targets, may reflect the dismay caused by the raid of the United States bombers on the Messerschmitt factory at Regensburg. Major General H. L. George, of the U.S. Army Air Forces, has made a statement to the effect that that raid destroyed 30 per cent. of the German production of day-fighters, that the damage to the factories would take at least six months to repair, and that, therefore, the *Luftwaffe* would be short of 2,000 fighters which could have been made in that time.

The General also expressed the opinion that the round-the-clock bombing now being let loose on Germany, by the R.A.F. at night and by the Americans by day, if continued with rising tempo, would cause the economic structure of Germany to fail by the end of this year. That, of course, does not mean that the General expects the Germans to sue for peace before December 31st next. It is, however, very satisfactory to hear of such a blow at the production of German fighters, as they are the only weapon, so far as is known, of which the German armies have felt a definite shortage in recent conflicts. The R.A.F.



THE QUEBEC MEETING. On the terrace of the Citadel. In the background the Chateau Frontenac. From left to right in the front row : Mr. Mackenzie King ; President Roosevelt ; Mr. Churchill. In the back row, left to right : General Arnold ; Air Chief Marshal Sir Charles Portal ; General Sir Alan Brooke ; Admiral King ; Field Marshal Sir John Dill ; General Marshall ; Admiral Sir Dudley Pound and Admiral Leahy.

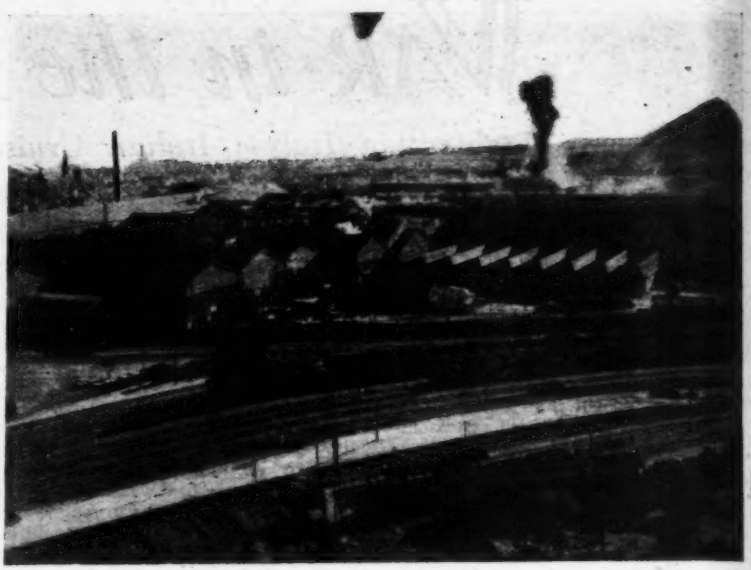
ENGINEERING

WAR IN THE AIR

can be well pleased that its efforts have contained from 50 to 60 per cent. of the existing German fighter strength in the west to oppose its raids. The big raid on Berlin on Aug. 23rd was met almost entirely by fighters, and their success in shooting down 58 of our bombers shows that on a clear moonlight night the fighter is growing ever a more formidable opponent to the night bomber. That truth will, no doubt, be brought home to the German bombers if they venture on another large-scale raid on London.

By way of contrast, the Germans succeeded in evacuating the majority of their troops from Sicily entirely thanks to a great concentration of heavy and accurate *flak*. The *Luftwaffe* kept well out of the picture, and there were complaints from our airmen that while still over Sicily they were not infrequently fired at by our own A.A. gunners.

After the Germans had got most (or at least many) of their men out of Sicily, the next job for the R.A.F. Mediterranean Command was obviously to attack all communications in Southern Italy, and the squadrons did this so successfully that in a few days it was barely possible to get a train through between the northern and southern parts of the country. Many of the troops who had escaped from Sicily met their fate from the bombs and machine-guns of Allied aircraft.



FRENCH STEEL WORKS BOMBED. The Hautes Fourneaux Forges et Aciéries de Denain et Danzin being well plastered by Bostons, two of which may be seen flying low over the target to ensure bombing accuracy.

It is some time since the newspapers have been enlivened by any news of the Italian Navy, and so the British public was genuinely surprised when it was announced last week that an Italian cruiser had been found off the southern coast of Italy. What was the poor misguided vessel doing there? She was far from the comparatively snug harbours in which her consorts took refuge a long time ago. The Mediterranean to the south of Italy is now ruled by Britannia, and the captain of that cruiser ought to have known it. It was fighter-bombers which tackled her, and they hit her twice and left her in flames. The Royal Navy must have felt jealous.

FIRES DOWN BELOW. Bostons of the R.A.F. attack the works of the Société Francaise de Constructions Mecaniques, near Valenciennes in daylight. Bombs can be seen falling.

New Tactics

FOGGIA, lying on the eastern side of the Appenines, is one of the most important railway junctions connecting Northern and Southern Italy. It is some miles to the north-east of Naples, and is surrounded by a number of fighter airfields. It became a matter of importance to cripple both the railway junction and the fighter strength of the place. On August 25th Gen. Spaatz began a determined offensive against the place, and he employed what were described as new tactics, which are reported to have proved highly satisfactory. Naturally, the new plan has not been made public, but some account of the raidings has come to hand.

The first attacks were made by successive waves of very strong formations of Lightnings, flying very low. They met with practically no opposition, and did a great deal of damage. Hardly any enemy fighters were able to get into the air. Then came a pause of half an hour, at the end of which Fortresses escorted by more Lightnings proceeded to bomb from heights of 20,000 to 25,000ft. The first raids had by no means destroyed all the enemy fighters on the various airfields, and when the bombers arrived a force of from 60 to 100 enemy fighters was waiting for them.

It was not at once stated whether the American machines suffered any losses, but once again the curious result was reported that the Fortresses shot down more of the enemy than their escort was able to do. The score was given as 16 victims of the guns of the bombers, while the escort only succeeded in bagging three. We may

GERMAN TANK-BUSTERS: Henschel 129 attack bombers captured by the Russians. In the foreground is an Me 109F. The 129 is powered by two 800 h.p. Gnome-Rhone 14M engines and carries a fixed armament of 2 machine guns and two cannon. A 30mm. MK 101 can be fitted under the fuselage for tank busting.

WAR IN THE AIR

presume that long-range fighters like the Lightnings could be evaded by the more manœuvrable short-range fighters of the enemy, but that does not altogether solve the problem.

The duty of an escort is to prevent enemy fighters from being able to attack the bombers, and if Lightnings were not up to the job what was the point of sending them out? We remember on more than one occasion that similar results have been reported when Fortresses have been escorted by Spitfires, which are certainly not inferior in performance to German fighters. Also we recall innumerable occasions on which medium bombers have raided Northern France and Spitfire escorts have kept the enemy fighters from interfering with them. The mystery remains; and it is not elucidated by the subsequent report that the number of enemy aircraft shot down in combat over Foggia was not 19 but 40, of which 38 fell to the guns of the Fortresses, leaving only two victims for the Lightnings.

Further reports have been issued by U.S. Army Headquarters in London about the raids on Regensburg and Schweinfurt by Fortresses on August 17th. The American bombers were escorted part of the way by Thunderbolts. According to the latest reports the Americans lost 59 machines in the two raids, but in return shot down 307 enemy fighters. No doubt fighters would attack the day-raiders all the way, and considerable bloodshed was to be expected. We have not the least doubt that the American Intelligence officers took the utmost pains to arrive at correct figures, but from the height at which the Fortresses usually fly it cannot be possible to see each enemy machine which crashes on the ground, and in the heat of the fight excited air gunners (who are only human after all) must tend towards optimism in making claims which cannot be exactly confirmed. It is, none the less, certain that the raid struck a heavy blow at German air power, and the gallantry of the American crews who made it was outstanding.

BRITISH & U.S. AIR LOSSES to AUG. 28th

	Over G.B. A'crft.	Continent B'brs.	Continent F'trs.	Middle East A'crft.	N.W. Africa A'crft.
Aug. 22	0	5	9	2	5
23	0	58	3	0	1
24	0	3	0	1	4
25	0	1	2	0	15
26	0	0	0	0	7
27	0	41	7	0	9
28	0	0	3	0	8
	0	108	24	3	49

Totals: West, 7,377; Middle East, about 2,229; North-West Africa, 1,128.

ENEMY AIR LOSSES TO AUG. 28th

	Over G.B.	Continent	Middle East	N.W. Africa
Aug. 22	2	7	0	29
,, 23	5	14	14	4
,, 24	0	15	1	0
,, 25	1	1	7	19
,, 26	0	2	0	19
,, 27	1	23	0	20
,, 28	0	2	1	53
	9	64	23	144

Totals: West, 7,348; Middle East, over 5,629; North-West Africa, 3,010.

South-East Asia Command

THE appointment of Vice-Admiral Lord Louis Mountbatten as supreme Allied Commander in South-east Asia foreshadows an active advance against Japan. He is a son of Admiral the Marquess of Milford Haven, who was so well beloved in the Navy when he was known as Prince Louis of Battenburg, and who kept the British Fleet mobilised during the critical days of August, 1914. Lord Louis has had plenty of fighting and some narrow escapes in the present war, and for some time past he has been Chief of Combined Operations, holding the honorary ranks of Lieutenant-General and Air Marshal.

As the war goes on, the need for the closest co-operation between the three Services becomes ever more apparent, and the key to success is the appointment of one Commander over all three. Few men have the experience and knowledge of any Service except their own parent Service which fits them for such a position, but Lord Louis is undoubtedly one of them. The Commander must also have the gift of welding British and American troops into one harmonious whole.

Blows from All Sides

THE very heavy raid on Berlin on August 23rd, followed up by nuisance visits by Mosquitoes, and then by a damaging attack on Nuremberg, found the German people in a mood the reverse of high-spirited. Himmler's appointment as Minister of the Interior was doubtless meant to stop expressions of down-heartedness in public. But there was no denying that German armies had been defeated, and that news, more than any other disaster, always depresses the militaristic Germans.

The defeat in Sicily and the fall of Fascism was immediately followed by striking Russian successes. Kharkov fell, and then Taganrog, and the German forces in the Kuban and even in the Crimea must be endangered. As is the Russian way, small mention of the part played by aircraft in the victories was made in the original announcements. Only scraps of information come through, such as that the Germans had massed bombers at a certain point, or that so many German aircraft had been destroyed or captured during some operation.

On the other side of the world the Japanese have been cleared out of New Georgia, while Australians and Americans are closing resolutely in on the important airfield of Salamaua in New Guinea. The Pacific war is still mainly a matter of aircraft and airfields, and the Allies are increasing their superiority in that respect. The capture of Salamaua should remove still further the threat to Australia; and soon, we hope, Rabaul will be added to General MacArthur's bag.

A.T.C. Summer Camp

Air Marshal Sir T. Leigh-Mallory Inspects East End Cadets : R.A.F. Instructors Give Specialised Training During Week Under Canvas

THE Air Training Corps has now been in existence for some two and a half years and numbers more than 200,000 cadets and some 20,000 officers in nearly 2,000 squadrons spread all over the country. It seems hardly necessary at this stage, therefore, to stress the importance to the war effort of this great and vigorous organisation.

But if anyone, in or out of the R.A.F. and the Fleet Air Arm, should need to be persuaded of the fact, then the value attached to the A.T.C. by the heads of the fighting air services will surely be evidence enough.

An outstanding example of this was recently provided when Air Marshal Sir Trafford Leigh-Mallory, A.O.C.-in-C. Fighter Command, R.A.F., paid a visit to an R.A.F. training station where the A.T.C. holds one of its biggest summer training camps. This camp is administered by London Command of the Corps, but it caters for cadets from adjacent A.T.C. Commands as well. That such a high ranking officer of the R.A.F. should find time, amid all the pressing duties devolving upon him in days like these, to make a special journey of some distance and spend several hours among the cadets, is eloquent testimony of the high regard in which the Corps is held by those at the top.

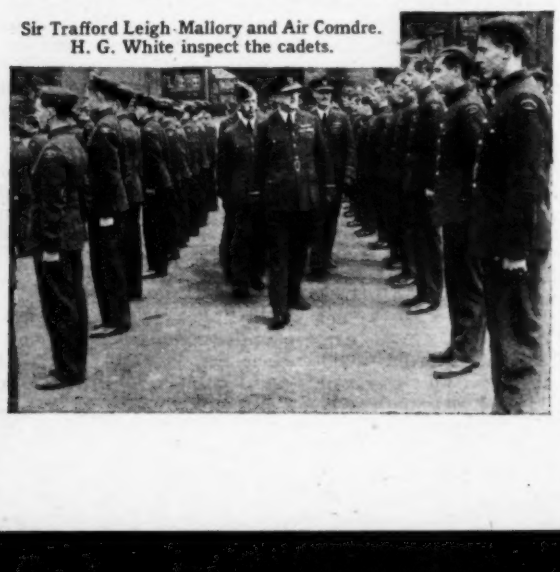
Between 200 and 300 cadets spend a week at this particular camp throughout the summer season from June to September, and at the time of Sir Trafford's visit there were present detachments from five squadrons of London Command and three from the South-East Command. These were Nos. 106 Orsett (Essex), 1014 Walthamstow, 308 Colchester, 1853 Lambeth and 34 Battersea, of London Command, and Nos. 354 Dover, 1219 Sutton and Cheam, and 1236 Swanley squadrons. An additional number of A.T.C. School units would also have been there, but they had been diverted to help in harvesting.

On Parade

Sir Trafford arrived at the station in time for lunch, and was received by its A.O.C., Air Comdre. H. G. White, and Sqn. Ldr. Salthouse, A.T.C. Commandant of the camp.

The smartness of the A.T.C. on parade is now generally accepted by all who have seen them on even the most modest of ceremonial occasions, but this was an occasion when that little bit extra was patently called for; true to the traditions which the Corps is steadily building up, the turn-out on the station's wide parade ground was worthy of a regiment of young Guardsmen. As each squadron in turn was brought to attention it did so as one man,

Sir Trafford Leigh-Mallory and Air Comdre. H. G. White inspect the cadets.



SIGNAL HONOUR. Particularly proud were those cadets with whom the A.O.C.-in-C. Fighter Command paused during his inspection to exchange a few words. This young flight-sergeant cadet may one day be a pilot in Sir Trafford's own command.

and not a muscle moved as Sir Trafford and his accompanying officers moved slowly down the ranks. Occasionally the Air Marshal stopped and spoke to a cadet, and one can readily imagine the young man's secret pride at being singled out by the head of Fighter Command for even the briefest conversation.

Last to be inspected was the band of Walthamstow Wing A.T.C., and very smart indeed they looked, with their white belts and gloves and the sun glinting on their drums and bugles. Then Sir Trafford took up his position at the saluting base, and the cadets marched past led by the band whose smart appearance was matched by its musical prowess.

From the parade ground the cadets marched back to the tent lines where their kits were laid out in impeccably neat array. And here, in an open space behind the lines, the boys were drawn up, "standing easy," in three sides of a square to hear what Sir Trafford Leigh-Mallory thought about them.

The Governing Factor

What he said to them must have inspired not only a glow of satisfaction but an equally strong determination to carry on with their work with unflagging energy until the job is finished.

The R.A.F. and the Fleet Air Arm, he told them, were depending more and more on the A.T.C. to supply the right material. Air operations had played an ever-growing part in the war until now they were the governing factor. He commended them for their excellent discipline and efficiency and gave a special word of praise to the band. Also he expressed his gratitude to the officers and instructors of the A.T.C. who, he reminded the cadets, were mostly busy men who cheerfully sacrificed what might have been their spare time to give them their training, the excellence of which was demonstrated by the results.

Lest it be suspected that the military precision displayed by the cadets on this occasion was a special effort only achieved by devoting a disproportionate amount of their

A.T.C. SUMMER CAMP

MARCH PAST. The very smart drum and bugle band of Walthamstow Wing A.T.C. led the march-past on the station's parade ground. Sir T. Leigh-Mallory, who is taking the salute, specially congratulated the band when he addressed the cadet's afterwards.

week's stay in the camp to assiduous practice, it may be opportune to state that, in point of fact, they had just one rehearsal of the parade and march-past on the Saturday morning. This was merely to establish the proper sequence of orders and movements; the precision with which the whole manœuvre was carried out was the result of their general training and could be taken for granted without any extra rehearsing.

Very little of the cadets' time in camp is spent in "square-bashing," as a matter of fact. Their normal day begins at 6.30 a.m. when, after a warming mug of "gunfire," they clean up their tent lines and perform their morning ablutions. Breakfast is at 8 a.m. and is followed by either P.T. or drill. After a brief spell of exercise they go to the adjacent airfield for instruction in such things as engine and aircraft maintenance. Then comes either musketry, instruction in the use of automatic weapons, firing on the range, an introduction to the parachute and its harness, or field training with a detachment of the R.A.F. Regiment. The last-named pursuit, incidentally, is said to be particularly popular, and it should also be mentioned that all this instruction is given by R.A.F. instructors whose services are at the disposal of the A.T.C. while in camp; it is, needless to say, greatly appreciated.

Well Fed

After dinner at 12.45 p.m.—and a very fine dinner it is, too, as *Flight* saw for itself—the afternoon is spent in swimming, which generally includes some air/sea rescue practice, and in various outdoor recreations, games or sports. Tea is at 5.30 p.m., and then the cadets are free for the evening. There are concerts and films they may attend if they choose, and occasionally talks by visiting R.A.F. pilots. During the week the cadets enjoy flights in either Domine or Oxford aircraft, and the canteen (dry, of course) is open during off-duty hours.

Reverting to the question of food, the cadets are given the same rations as are served to R.A.F. airmen, and one had only to look at the generous helpings carried from the serving cooks to the mess tent, and the completely empty plates with which they emerged, to be quite sure that there was no cause for complaint under this heading. This good feeding, plus the exercise and healthy life under canvas, is reflected in every cadet's tanned face and bright eyes by the end of the week, while their cheerful demeanour indicates what a grand holiday it is for those who are fortunate enough to get there.

Not that they are lacking in cheerfulness when they arrive on their first Saturday. One A.T.C. officer described how, on their first night in camp, most of the cadets sing in their tents well into the night.

"It's a bit irregular, of course," he grinned, "but we don't clamp down on it. By the Monday night we know they will be so comfortably tired that they will drop off to sleep as soon as they get under their blankets."

The officer went on to explain that, boys being boys, it is necessary to find them some controllable fun on the Friday night—the last under canvas—otherwise ragging is almost sure to break out. Generally this takes the form of a dance to which members of the W.A.A.F. and any available "Naffy" girls are invited. These camp dances are invariably a thoroughly enjoyable climax to the week and it is a moot point as to who enjoys them the more—the cadets or their officers.

DINNER-UP! Healthy appetites, the result of vigorous days under canvas, are generously satisfied by the camp cookhouse. The menu, set out in full on the blackboard, is the normal ration served to R.A.F. airmen.

THE MOSQUITO COLLISION

FORTUNATELY, accidents such as that which befell the crews of two Mosquitoes last week are extremely rare, a fact which is the more remarkable in view of the crowded nature of the air around many districts. On this occasion two Mosquitoes were out on flight tests, one piloted by Mr. John de Havilland, and the other by Mr. George Gibbins. Mr. John Scrope accompanied Mr. de Havilland, and the observer in Mr. Gibbins's machine was Mr. G. J. Carter. The collision occurred in the vicinity of St. Albans, and all four occupants lost their lives.

Mr. John de Havilland was a little under 25 years of age. He was the third son of Capt. Geoffrey de Havilland, founder and technical director of the De Havilland Aircraft Co., Ltd. John de Havilland was a sergeant in the R.A.F.V.R. before the war, but was released to become a test pilot to his father's firm. Capt. de Havilland's other sons, Geoffrey and Peter, are also test pilots to the company, Geoffrey being chief test pilot.

Mr. George Gibbins was 34 years old and leaves a widow but no children. He joined the firm as an apprentice in 1925, and started test flying in 1937. Lately he had been almost exclusively engaged in testing Mosquitoes.

Mr. G. J. Carter was 32 years of age and single. He was a former student in the D.H. Technical School, joined the firm as a fitter in 1933, transferred to the inspection department in 1936, and became a supervisor in 1938. Lately he had been supervisor of the flight shed.

Mr. John H. F. Scrope was 24 and single. He was educated at Beaumont, and joined the D.H. Technical School. In 1940 he entered the aerodynamics department and lately had flown extensively with Mr. de Havilland as flight test observer.

PHILLIPS AND POWIS PILOT KILLED.

LAST week one of the test pilots of Phillips and Powis Aircraft, Ltd., Mr. C. B. Field, was killed while testing a Master II. His passenger, Mr. M. Cullimore, baled out safely. The cause of the accident was not known at the time of going to press, but the aircraft is believed to have been in a steep high-speed dive when something went wrong.

D

Sixty-fourth of the Latest Recognition Series

Aircraft Types and

DEFIANT II TARGET TUG

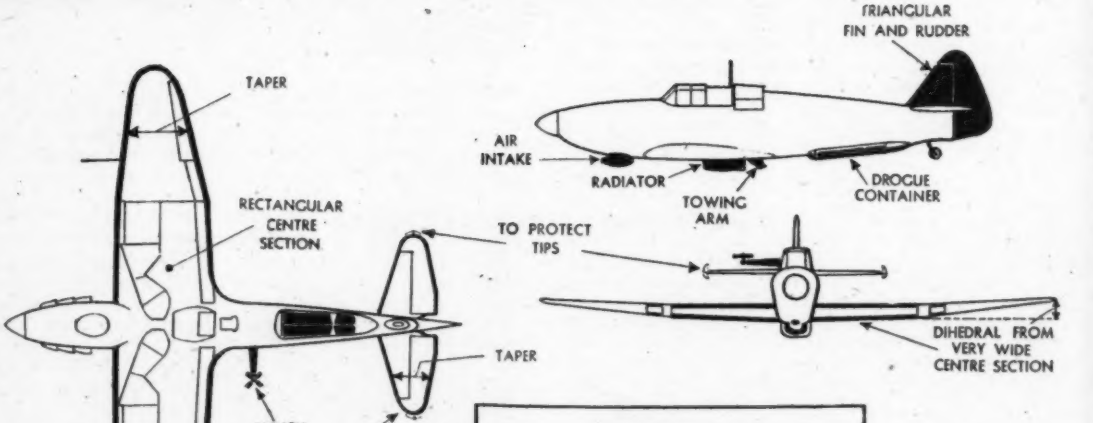
TARGET towing has, in the past, been one of a variety of jobs given to obsolescent aircraft.

But aerial combat takes place to-day at such high speeds that it has been necessary to use much faster tugs than hitherto so that pilots can be trained under conditions approximating more closely to those they will experience in actual operations against the enemy. Few of the older types adapted for drogue towing meet present-day requirements except the Hawker Henley (which was originally designed as a fighter but never went into service as such) and the Miles Martinet, which was specially designed for target towing comparatively recently.

To augment the Henleys and Martinets, the Boulton Paul Defiant II has now been modified for drogue towing, and it is the first modern fighter so to be employed. The type, however, is still in service with the R.A.F. as a day and night fighter, and yet another version, with a two gun turret, functions as a gunnery trainer.

While the main characteristics of the Defiant, particularly its informative triangular fin and rudder, have clearly survived the adaptation, the tug version does present a number of important changes in outline. First and foremost, the once familiar four-gun Boulton Paul turret has disappeared and in its place there is a slightly raised transparent cockpit cover. A winch projects from the starboard side of this cockpit, there is a short arm projecting from the bottom of the fuselage just behind the radiator, and immediately aft of this arm is the long shallow container housing the drogue target itself. This container extends to within a few inches of the tailwheel. The cable from the air-driven winch passes through the arm to the drogue. The small projections seen on the tailplane tips are wires to prevent accidental damage from the cable when the drogue is in tow.

Powered by a 1,260 h.p. Rolls-Royce Merlin XX engine, the top speed of the Defiant with drogue in tow is about 260 m.p.h. at 20,000ft., as compared with 306 m.p.h. at 13,500ft. for the turret fighter version.

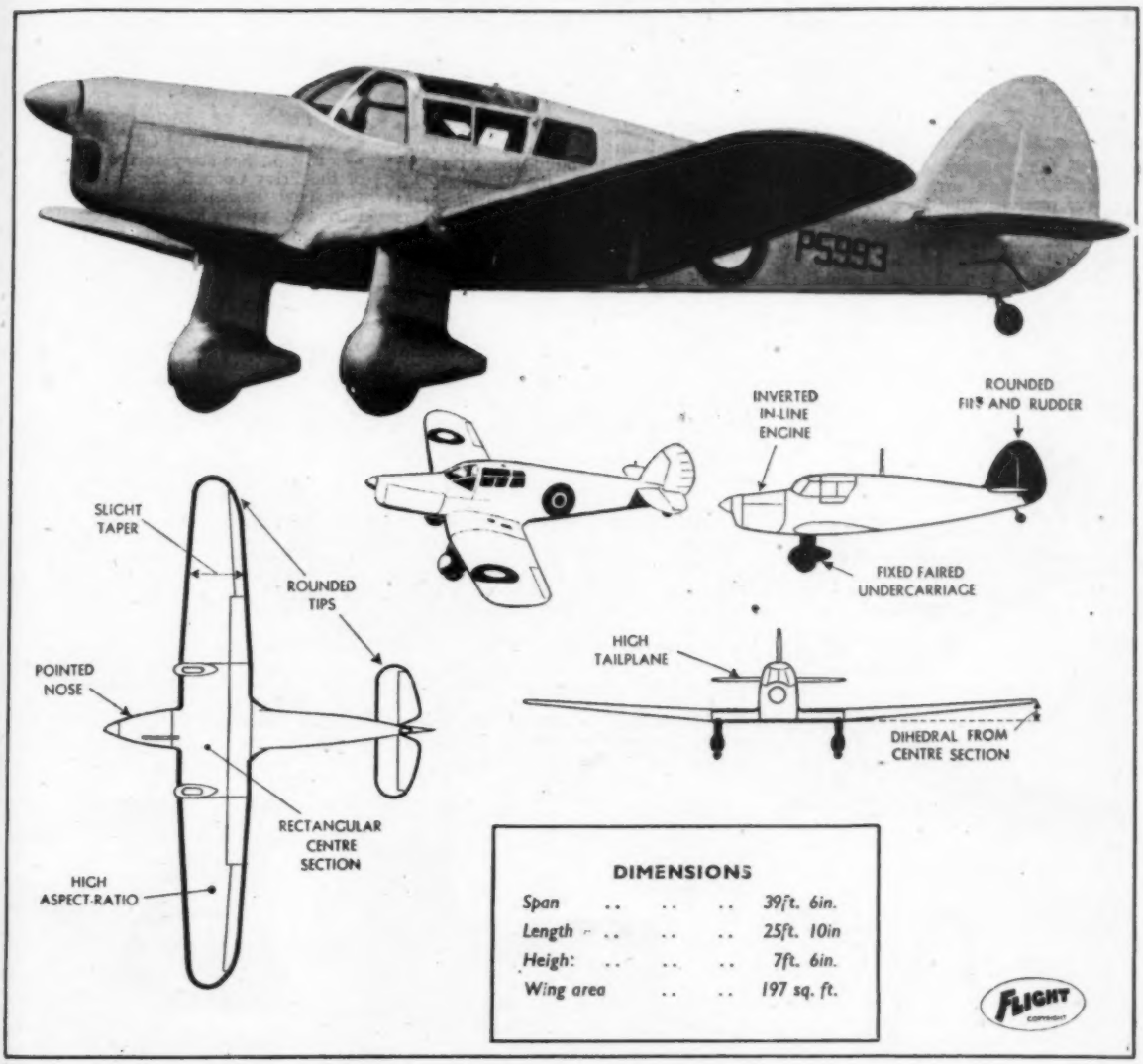


DIMENSIONS

Span	*39ft. 4in.*
Length	*35ft. 0in.*
Height	*11ft. 0in.*
Wing area	*250 sq. ft.*

...Their Characteristics

PERCIVAL PROCTOR



DIMENSIONS

Span	*39ft. 6in.*
Length	*25ft. 10in*
Heigh:	*7ft. 6in.*
Wing area	*197 sq. ft.*

FLIGHT COPYRIGHT

AMONG the pre-war civil types of light aircraft which, with the necessary modifications, proved to be useful machines for various non-operational duties, the Percival Proctor has been particularly successful.

The Proctor, which has fulfilled the role of communications aircraft with both the R.A.F. and the Fleet Air Arm, and that of a deck-landing trainer with the latter Service, is a military version of the well-known civil Vega Gull four-seater which had established an admirable reputation for itself just before the outbreak of war.

The modifications which turned the Gull into the Proctor were only minor ones, about the only external differences to be seen being a redesigned windscreen and the presence of an aerial mast on the turtle-deck aft of the cabin. Internally, the need to find room for wireless equipment meant reducing the seating accommodation from four to three.

The airframe of the Proctor is entirely of wood, the high aspect-ratio, slightly tapered folding wings with rounded tips being built up of spruce and plywood with fabric covering, while the fuselage is a plywood structure with plywood covering. The wooden tail unit is fabric covered like the wings. The fixed, faired undercarriage is of the cantilever type, the wheels being enclosed in streamlined spats.

Its de Havilland Gipsy Six Series II inverted in-line, air-cooled, six-cylinder engine has a normal rating of 185 h.p. at 2,100 r.p.m. at sea-level, and develops 205 h.p. for take-off. With a loaded weight of 3,250 lb., the Proctor has a top speed of 180 m.p.h. at 1,000ft. and a very useful cruising speed of 172 m.p.h. at 7,000ft. Its wing-loading is 16.5 lb./sq. ft., and its power-loading 15.85 lb./h.p. With a normal tankage of 40 gallons of fuel, it has a cruising range of 600 miles, and its service ceiling is 17,000ft.

It will thus be seen that the Proctor, whether used on communications or for training duties, has a very satisfactory performance for its size and power, allied to a high degree of economy—qualities which, accompanied by nice flying characteristics, were collectively responsible for the success and popularity of the Vega Gull in happier days.

HERE AND THERE

All for Half-a-Dollar

TO judge by our voluminous contemporary, *Aero Digest*, there can be no paper shortage in America.

The June number of this bulky monthly numbers no fewer than 476 pages and it weighs precisely 2lb. 4oz.

A Misquotation

SINCE the paragraph "Per Derby *ad Astra*," page 261, went to press, we have received from Mrs. Peter Masefield a letter to the effect that her husband has cabled from America a categorical denial of the statement attributed to him in the cable published in certain sections of the lay press. We are happy to give prominence to this disclaimer.

Synthetic Cloud-cover

ANOTHER new device, reported by Swedish refugees from Hamburg to be used by the R.A.F. in bombing raids, is the dropping of masses of sheets of paper, black on one side and silvered on the other, which deflect and reflect searchlight rays.

The bombers were thus hidden, they said, behind a carpet of blinding reflections!

Fewer Overhauls

AN increase of 50 per cent. in the period between overhauls is reported to have been achieved by improvements introduced by the designers in a Russian aircraft engine factory.

Whether these improvements are in the actual design of the engine, in the materials used, or in the methods employed in their manufacture is not disclosed; it might, of course, be a combination of all three, since the increase is a substantial one.

Swedish Research

A FIVE-MAN committee charged with the task of working out suggestions for the construction of an engine for the research institute was recently appointed by the Swedish Minister of Trade.

Professor Ivar Malmer, director of the Aeronautical Institute at Stockholm-Bromma, is a member of this committee, and the new research installation, which will be used for the investigation of both aircraft engine and airscrew problems, will probably be placed under the Bromma institute.

Marauding from Britain

PREVIOUSLY used by the R.A.F. and the U.S.A.A.F. only in the Middle East and Far East, the B-26 Marauder medium bomber is now being operated by the Americans from bases in Great Britain on daylight raids.

With a top speed of over 300 m.p.h., a range of 2,400 miles, and a bomb load of 2,460 lb., the Marauder has already done much useful offensive work against the Axis, but the Truman Committee has passed adverse judgment upon it because, they say, it is too expensive to manufacture and is so tricky to take off and land (a blow to tricycle undercarriage enthusiasts) that only pilots specially trained for the job can handle it with safety.

Production of the Marauder, therefore, is to be "tapered off" in favour of other well-proved types.

All-Brazilian Fairchilds

LAST year the Brazilian Government entered into a contract with Fairchilds, U.S.A., to build the PT-19 for training purposes in the Brazilian Air Force, this being recorded in *Flight* at the time.

Up till now, however, the 175 h.p. inverted six-cylinder in-line air-cooled Ranger engines fitted to the Fairchild trainer had to be imported from the States, but now Brazil has completed arrangements, through her Embassy in Washington, to manufacture the engines also.

The contract embraces Ranger engines up to 200 h.p., and they will also be fitted to the Grumman Widgeon flying-boats used in the Brazilian coastal patrol, the Amazon patrol, and for air-mail deliveries.

Change in "Light Metals" Directorship

MR. HORACE W. CLARKE has retired from the Directorship of the Light Metals Extrusions Control, for the organisation of which he was initially responsible in October, 1939. He is succeeded by Mr. G. Meredith, previously Deputy-Director under Mr. Clarke. Mr. H. J. Sells becomes Deputy-Director and Mr. W. H. Smith, Assistant Director.

Mr. Clarke is managing director of James Booth & Sons, Ltd., and of Wilkes, Sons and Maplebeck, Ltd. He has been chairman of the Wrought Light Alloys Association since its inception, and is actively concerned with other non-ferrous metal trades associations as well as being a member of the Grand Council of the F.B.I.

"Father of Radiolocation"

SIR EDWARD APPLETON, K.C.B., F.R.S., Secretary to the Committee of the Privy Council for Scientific and Industrial Research, has recently had bestowed upon him by Lord Cecil, Chancellor of Birmingham University, the Honorary Degree of Doctor of Laws.

Referring to Sir Edward as "the father of radiolocation," Professor Ritchie, the university's Public Orator, said at the investiture that the methods of radiolocation differed only in detail from those devised by Sir Edward from the study of a purely scientific problem.

Presentation to Lt. Col. J. A. Cole

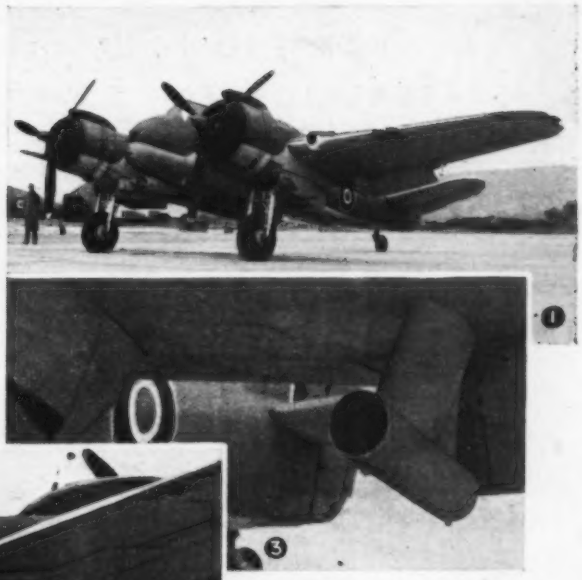
ON the occasion of his retirement from the chairmanship of Humber, Ltd., and its subsidiary companies, Lt. Col. J. A. Cole, O.B.E., was presented with a fine antique clock by Sir William Rootes at a dinner given in his honour.

Sir William, who succeeds him as chairman of the combine, paid tribute to Lt. Col. Cole's untiring work in the development of the aircraft shadow factories, and mentioned that a cot and full equipment in the Coventry and Warwickshire Hospital was being endowed in his name by the staff and workpeople.

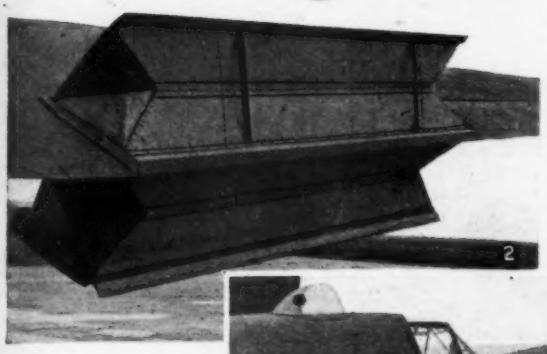
Lt. Col. Cole said he was "75 not out, innings declared." Future work, he felt, would be best in the hands of younger men than himself.

CHECKING UP: Cadet Johnson, of No. 1256 (Swanley & Dist.) Squadron A.T.C., the 15½ year old mascot of an A.T.C. summer camp (yes, they call him "Tich," makes sure he has been given a man-sized dinner—just to oblige the Press photographers!

Torpedo Beaufighter

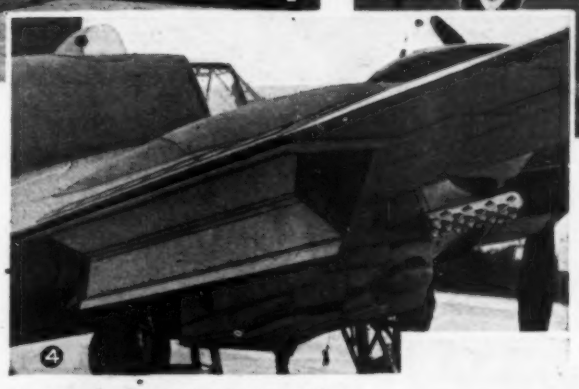


1. The Torpedo Beaufighter.



2. The bellows air brakes fully extended. The upper halfisshown propped up by temporary struts because it is not normally possible to open it while the machine is on the ground. The tension wires are fitted to limit the travel of the upper half which is in an area of negative pressure.

3. Airbrake-operating Venturi. At the back of the tube is a butterfly throttle. A pipe leads to the bellows. If the throttle is open a partial vacuum is caused in the pipe and the brakes are sucked flat. If the throttle is closed the air pressure fills the bellows and the brakes are extended.

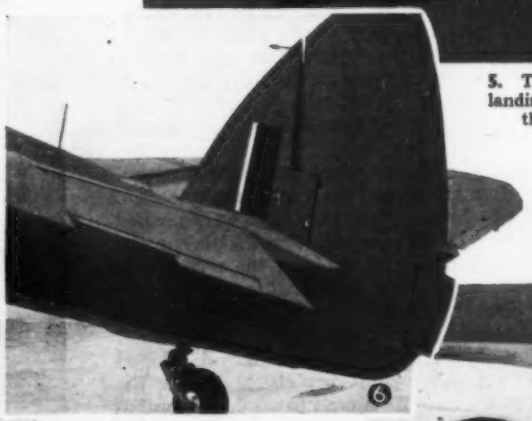


4. The lower half of the bellows used as a flap. The ribbed surface of the top half can just be discerned.

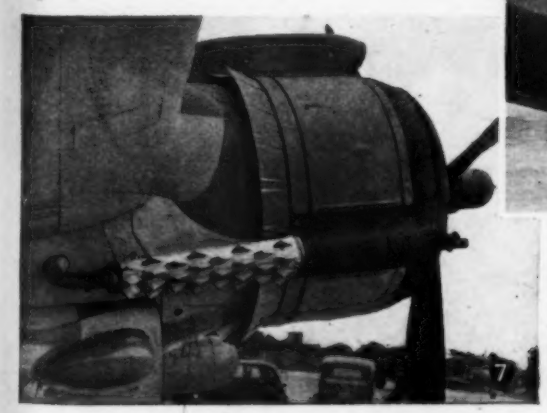
New "Flight" Pictures of the Hardest-hitting Aircraft in Service To-day

UNTIL comparatively recently the Air Staff have insisted upon specialised types of aircraft for each different form of offensive and defensive work. Now the tendency is towards general-purpose machines—more particularly in the fighter sphere where the high speed inherent in the type is of much value in defeating the enemy

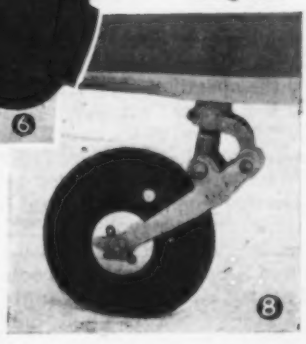
5. The Harley landing lights in the wings.



6. The Beaufighter tail surfaces and their trimming tabs.



7. A reminder that torpedoing occurs also at night is the special flame damping exhaust pipes. The air-intake on the top of the Bristol Hercules contains a special Vokes aircleaner for use in the Middle East.

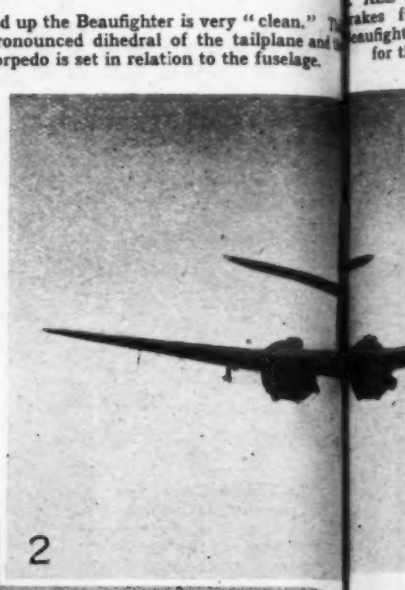


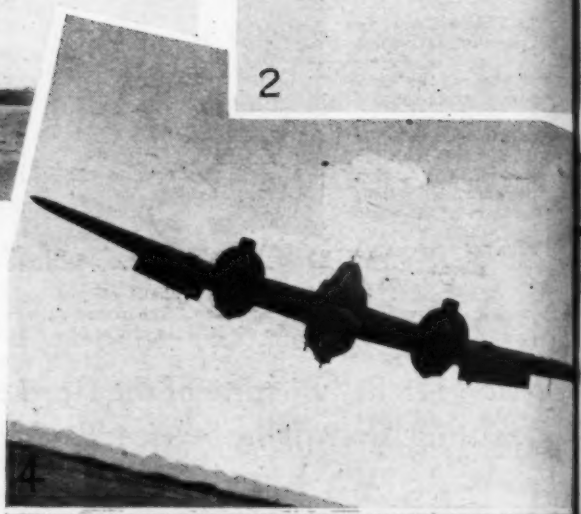
8. The retractable tail wheel of the Beaufighter is of different design from the one originally employed.

TORPEDO BEAUFIGHTER

1. For take-off only the lower halves of the bellows air brakes are as flaps. The wheels are semi-retracted.

2. With everything tucked up the Beaufighter is very "clean." The view shows clearly the pronounced dihedral of the tailplane and the angle at which the torpedo is set in relation to the fuselage.





defence. The Bristol Beaufighter is an outstanding example. When details of the Beaufighter were first published the world of military affairs gasped at its hitting power. Four 20 mm. cannon and six .303in. machine guns; an available speed on the level of over 330 m.p.h., together with a range of 1,500 miles, make it a formidable air weapon.

As a day fighter it was—and still is—used wherever long range became a necessity. As a night fighter it took on the major portion of the defence of Great Britain.

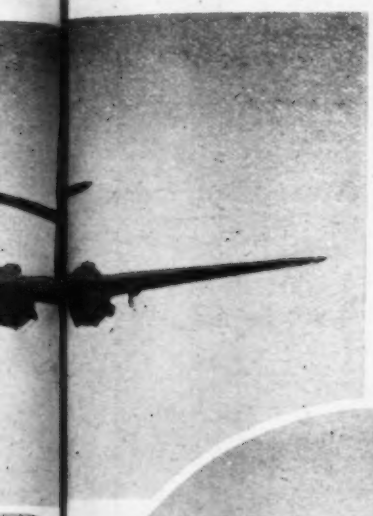
Next it appeared in communiqués as an enemy convoy strafer, and later has been referred to as a bomber carrying two 500 lb. missiles. One of its most successful roles, however, has been its employment as a torpedo carrier. Fitting the torpedo has reduced the maximum speed at sea level to approximately 300 m.p.h., but even so, this puts the torpedo Beaufighter in a class by itself.

As would be expected, the exact technique of dropping torpedoes from high-speed machines is very secret, but it is generally known that they can be launched from any height up to about 150ft., and that it is usual not to exceed a speed of 160 knots at the moment of release. The ideal approach would be at maximum, terminating in an almost instant drop to the lower dropping speed. This is closely approximated in the Beaufighter by the operation of special bellows air brakes developed by the Bristol Company. In a very clever manner the forward speed of the aircraft is used to apply the brakes and also to take them off again.

The torpedo Beaufighter has two improved Bristol Hercules engines, developed from those used in the standard fighter type. The all-up weight of the aircraft has increased from 21,000 lb. to 25,000 lb. Stalling speed is in the neighbourhood of 80 m.p.h. and, despite the wing loading of over 49 lb./sq. ft., the Beaufighter with torpedo clears a 50ft. obstacle in 750 yards.

"WHISPERING DEATH." A Beaufighter ...es overhead with an almighty whoosh—to ...e followed by a rustling, murmuring whisper.

ALL READY TO DROP. With air ...akes fully extended to slow down the ...eaufighter, the pilot makes a dummy run for the benefit of the photographer.



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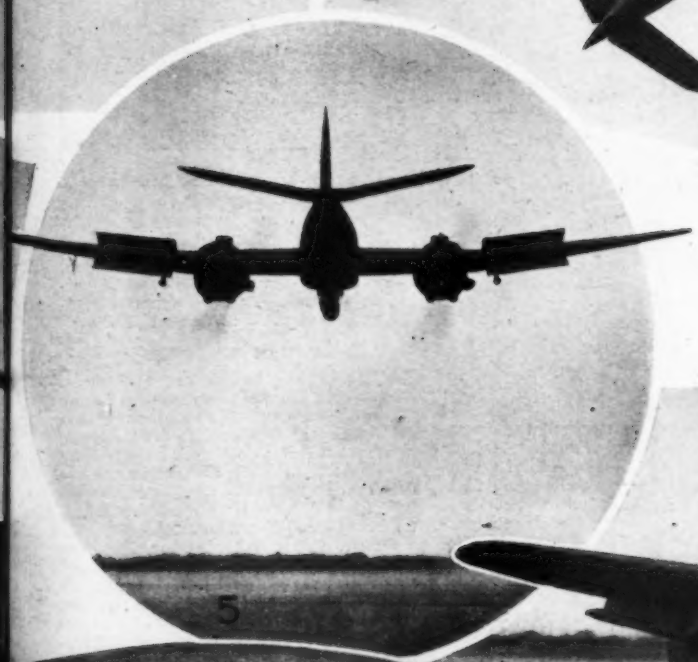

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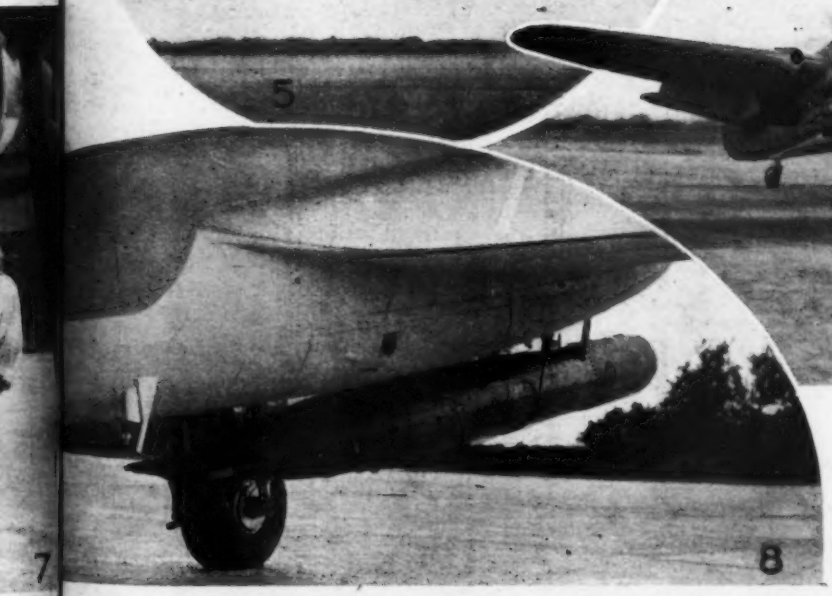

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8

5. A rear view of the Beaufighter with the special bellows air brakes cum flaps in operation to reduce speed.

6. For landing a combination of the lower half of the airbrakes and ordinary split flaps are employed.

6

7. Three test pilots of a Beaufighter factory. Left to right: R. Ellison, Flt. Lt. G. A. Reston and E. H. Statham. All test work is, of course, carried out under Bristol's chief test pilot, Capt. Cyril Uwins.

8. Affectionately known as a "mouldy," the torpedo is slung by a wire hawser below the fuselage and steadied against crutches. After the torpedo is dropped elastic rope pulls the hawser clear of the escape hatch.

LOCKHEED ENGINEERING

Behind the Lines

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Rumour ?

BECAUSE cars are now waiting outside some public offices and officials are seen loading them with documents, rumour-mongers—says a German paper—are naturally ready with the explanation that "the Government is leaving Berlin." But the writer assures the public that only essential records are being evacuated, together with the staff required to deal with this material. "The Government and other Reich authorities will remain in Berlin."

Nerve Soother

A NOTICE in a German daily announces that the dark silver paper strips dropped by Allied bombers are harmless to man and beast, and contain only a small quantity of arsenic sihce "they are intended for other purposes."

As reported in the "Here and There" page of this issue, these strips, which according to German reports measure 0.5 x 11in. and are dropped by Allied aircraft to deflect enemy searchlight rays.

Smoke-thrower

THE latest weapon employed by the Germans on the Russian front is a new type of fog-thrower. This simply constructed, six-barrelled gun projects alternatively smoke shells and anti-personnel projectiles.

According to German reports the multiple explosive salvo is also effective in the destruction of field positions and pill boxes.

The smoke-thrower is used for protection against strafing and in ground combat. In contrast to previously employed shells which could be easily identified by their smoke trail, in the new projectiles now said to be used, a smoke-eliminating method makes them visible only by the trajectory showing a red glow.

Axis Fuel

SOME details on the rapid increase in Japan's fuel supply due to the capture of important oil-producing areas are given in an estimate presented at a recent meeting of the American Institute of Mining and Metallurgical Engineers.

In 1941 Japan's total output was 8,800,000 barrels of which 5,500,000 were petroleum substitutes. In 1942 the synthetic fuel production was further increased, raising the total home production to an estimated 10,000,000 barrels.

In the Burma and Dutch East Indies oilfields gained by Japan, and which before the war produced 78 million barrels, only 23 million barrels were produced in 1942.

From these estimates it would appear that Japan is now getting yearly at least 33 million barrels.

The 1942 fuel output of European Axis countries and controlled areas is estimated at about 112 million barrels, or 20 per cent. greater than in 1941.

Reliable sources report a steady increase of Germany's synthetic fuel output which, in 1942, is said to have amounted to 46 million barrels. This would indicate that nearly half of the German supply is now petroleum substitutes.

Ersatz

ACCORDING to a German report, hard porcelain is now being used in Germany in the engineering industry. As a result of a new process, highly polished hard porcelain can be combined with iron and steel parts which makes its employment possible not only in the electrical industry but also in the production of instruments.

Successfully employed in the manufacture of centrifugal pumps, valve fittings, etc., the new material is described as an excellent substitute for different metals.

Luftwaffe Mysteries

IN the last issue we reported the death of two *Luftwaffe* leaders, Air Marshal von Witzendorf and General von Chamier-Glisczinski. While the first report of the German radio described Glisczinski's death as a fatal accident without giving further details, it now transpires that he was found dead with a revolver bullet in his back at his laboratory shortly after the R.A.F. raid on the Peenemunde research centre.

In November, 1941, General von Chamier-Glisczinski was promoted to the rank of Major-General, and at the time of his assassination he was in charge of the experimental factory at Peenemunde, near Stettin, engaged on a new secret weapon, possibly jet-propulsed aircraft. Berlin reports announce that Gestapoman Streckenbach, Himmler's first lieutenant, has taken charge of investigations of this mysterious case.

In quick succession to this news follows a report of the death of Col. General Hans Jeschonnek, Chief of Staff of the *Luftwaffe* and a close collaborator of Goering. Jeschonnek, who was 53, and one of the *Luftwaffe's* "old-timers," was known as Hitler's confidential advisor on air affairs. In 1917 he joined the Air Force and was awarded the Iron Cross, First Class. After the war he served as pilot in the Upper Silesian Frontier Corps, and in 1939 he became Chief of the General Staff of the *Luftwaffe*.

His disappearance is shrouded in mystery, since according to official reports he suffered from a serious illness which, however, did not prevent his participating at a meeting at the Fuehrer's headquarters as recently as August 7th.

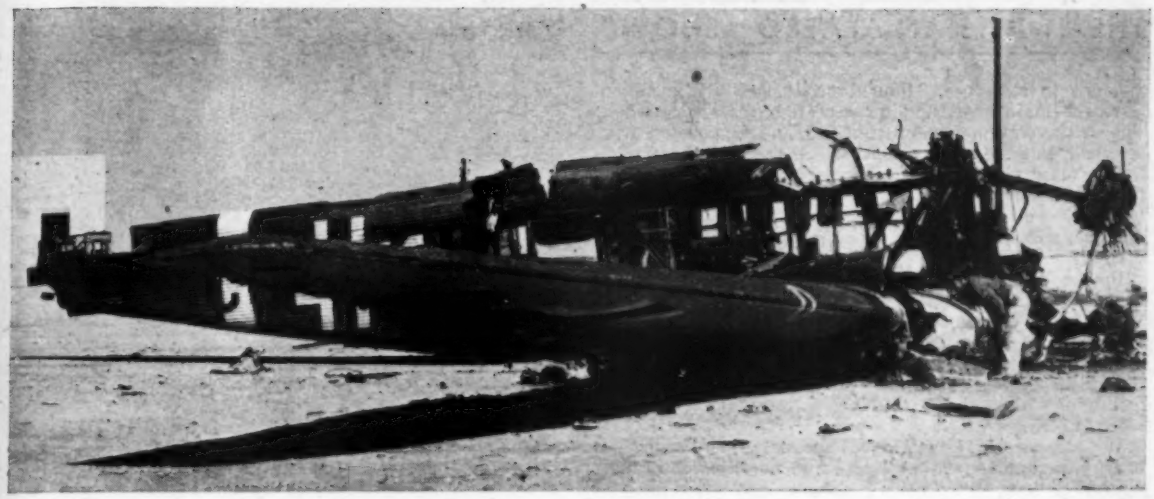
The six-barrelled smoke-thrower described in a paragraph on this page.

Industrial Rome

FOLLOWING the bombing of Rome, a fervent campaign designed to deny the existence of military objectives and culminating in the declaration of Rome as an open city has been launched by the Axis. In this connection a few details of the deliberate and gradual transformation of Rome into an industrial centre will be of interest.

Under a law published on February 6th, 1941, a public corporation called the *Ente per la Zona Industriale du Roma* was formed by the Italian Government to carry out an ambitious programme of Rome's industrial development, and on November 17th, 1942, the *Neues Wiener Tagblatt*, a well-informed Viennese daily, published a report giving the following information: "Rome, which in 1922 had 3,000 industrial enterprises with some 60,000 workers, counted in 1939 4,570 plants employing a total of 139,000 men."

The already mentioned public corporation has been empowered to expropriate owners of land within the limits of the new industrial zone and to sell lots to industrial firms for erection of plants. Out of 211 firms which have availed themselves of this opportunity, two-thirds were Roman enterprises anxious to secure accommodation for their expanding plants, and the rest were industries from Northern Italy. To foster the industrial development of Rome and to attract North Italian firms to establish plants, the Italian Government has allowed considerable other facilities, such as tax reduction, etc.



"To the salvage officers it must have been El Dorado." The wreckage of a Junkers Ju 52 transport on an airfield in Northern Africa.

The Tunisian "Aero Show"

Some Impressions of Axis Equipment Used During the Final Stages of the North African Campaign

A FEW minutes in a Jeep from the centre of Tunis is El Aouina airfield. When the Allied forces moved in, the perimeter was studded with shattered hangars and the grotesque wreckage of scores of Axis aircraft of all classes. To the salvage officers, who were early on the scene, it must have been El Dorado; to those uncompromising enthusiasts who hold that aircraft are not of interest unless they can be flown on the spot it was something of a disappointment (though not entirely unproductive); but to the student of military aircraft design it was truly a wartime aero show, exhibiting some of the newest products of German and Italian factories.

OUR contributor, who has had an opportunity to study the many German aircraft found damaged or abandoned in Tunisia after the German defeat, brings to bear his extensive knowledge of the subject. In this first article he deals with transport types. Other classes will be described next week.

Like all the best aero shows it had a keynote and a *pièce de résistance;* the keynote was large transport aircraft and the *pièce* the Me 323.

It is hard to imagine one of these 180ft. monsters (the Germans call them "Giants") in the *Grand Salon* in Paris, but on this dusty African field there were eleven. True, they were not in their show finish; Allied strafing and destructive action by their late owners (in some cases a 250 kg. bomb had been exploded under the nose of the fuselage) had blasted or burned most of the fabric from the steel-tube skeletons, buckled the structural members and generally produced a picture of ragged dejection.

A breeze from the "Med." rustled the remnants of coarse fabric and stirred the blackened, splintered plywood.

Happily the destruction was largely superficial, and one could form a clear picture of what the complete aircraft had been like.

Willy Messerschmitt and his staff must be given credit for a good job in having designed this remarkable trooper and freighter, the type number of which, unlike those of the 109 and 110, but in common with that of the 210, is properly prefixed by "Me" and not by "Bf." The latter contraction signifies *Bayerische Flugzeugwerke.*

The 323 wing is typically Messerschmitt in plan form,

The Focke-Wulf FW 200 (Condor) is among the large German four-engined aircraft adapted from commercial types.

THE TUNISIAN "AERO SHOW"

but not in structure. Four braced steel-tube members form the main spar, and most of the ribs are of wood. The centre-section has no dihedral and is covered with plywood, but the outer panels, which taper to characteristically blunt tips, are plywood-covered only as far aft as the spar, the remainder being fabric-covered. The familiar mass-balance weights hang from the fabric-covered ailerons, which are of high aspect ratio, and servo or trim tabs are embodied in the trailing-edge flaps.

In the design of the fuselage every consideration has been subordinated to that of providing the maximum of unobstructed stowage space, of which more later. Welded steel tubes of large diameter form the main structure, but at points which are highly stressed (such as the main freight floor) there are massive girders. The section is rectangular throughout, and the covering is fabric over wooden stringers.

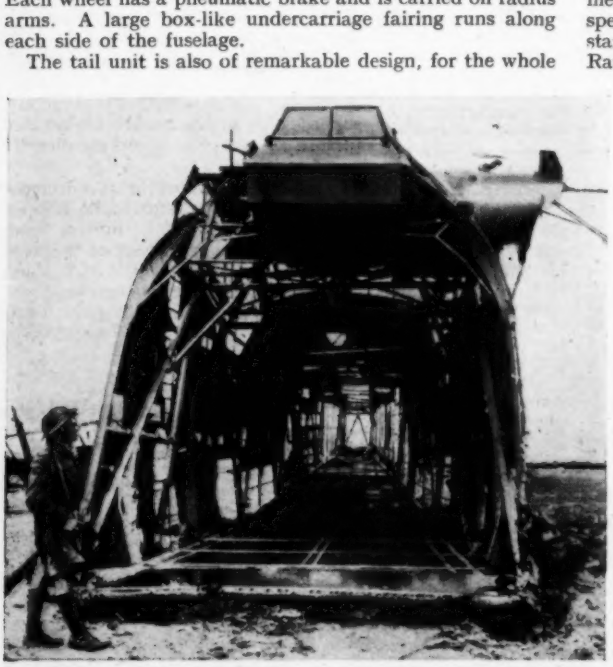
Well forward in the fuselage is the main floor, and above it are attachment points for a second floor, which did not appear to have been fitted; instead, a number of 323s had a secondary floor to the rear of the main compartment. As the fuselage structure in this vicinity is comparatively weak it has been necessary to sling this supplementary floor by cables from the upper longerons. Thus ample stowage space has been provided.

To arrange loading facilities must have been equally trying. The solution is bold but logical. The nose of the fuselage is, in effect, split vertically, each half being hinged to swing open sideways. Heavy wooden ramps are carried on the aircraft so that vehicles (lorries, etc., not tanks) can be driven into the aircraft, the tail of which is steadied by folding members attached to the bottom of the fuselage.

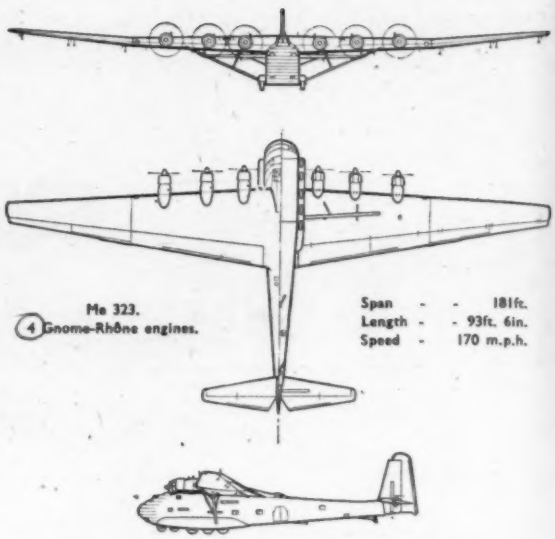
A Ten-wheeled Undercarriage

The undercarriage of the Me 323 is probably the strangest ever used on an aircraft. There are ten wheels—six main rear wheels and four smaller front wheels, the latter only touching the ground during landing, loading or unloading. Each wheel has a pneumatic brake and is carried on radius arms. A large box-like undercarriage fairing runs along each side of the fuselage.

The tail unit is also of remarkable design, for the whole



The skeleton of the fuselage of the Me 323 is in the form of welded steel tubes of large diameter. Some of the structure can be seen in this picture of a crashed machine.



assembly moves when the tailplane incidence is adjusted. The movement—over a range of −5 deg. to +2½ deg. is effected by a powerful hydraulic jack in the bottom of the fuselage.

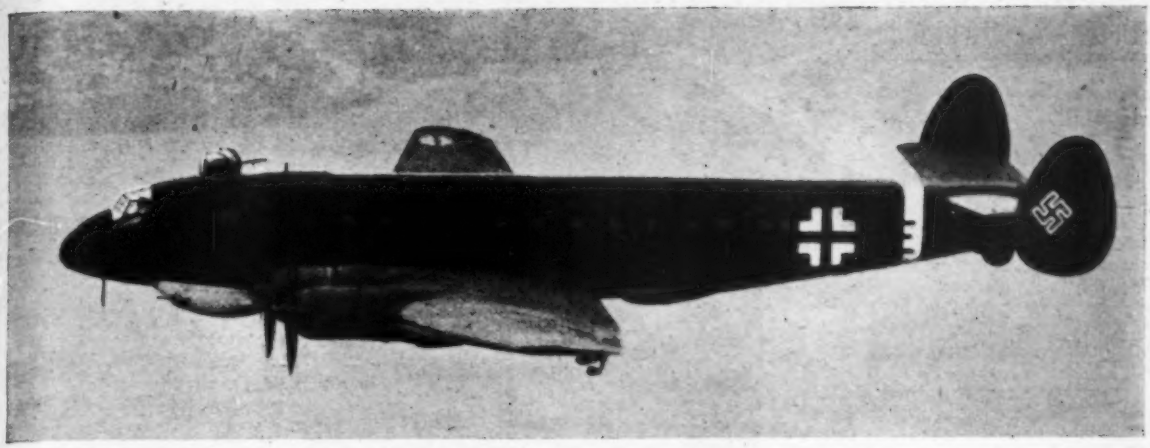
Mounted in line abreast along the leading-edge of the wing are six French-built Gnome-Rhône 14N fully-supercharged 14-cylinder radials. Apparently the distance between the outer and middle engines on each side is greater than that between the middle and inner ones. The port engines are left-hand tractors and the starboard right-hand tractors. They were originally intended for installation in Lioré et Olivier 451 bombers of the French Air Force, and according to data plates they have a maximum output of 980 c.v. at 12,200ft. No adjustable cooling gills are fitted to the long-chord cowlings, and one aircraft at least had two-blade fixed-pitch wooden airscrews (11ft. 10½in. diameter), though three-blade French-built Ratier constant-speed metal airscrews of 10ft. 10½in. diameter seemed to be standard. A significant point is that the aircraft with the Ratiers had rigid engine mountings, whilst the type with wooden airscrews had flexible mountings with hydraulic shock absorbers at each of the four attachment points.

To assist the take-off, provision is made for four rockets to be carried under each wing, to the rear and outboard of the outer engines. These are touched off by the first pilot, who has a box with eight indicators and four switches. On one aircraft were two cable attachment points with quick-releases for towing by aircraft. Each was marked "8 tons." In this connection it may be recalled that the Me 323 is a powered development of the Me 321 glider.

Each wing houses six self-sealing petrol tanks of the standard fibre, leather and rubber type, each tank holding 895 litres (197 gals.) of 87 octane fuel.

Of few aircraft is it strictly true to say that they bristle with guns, though if all the available positions on the Me 323 were utilised simultaneously—which is unlikely—this would be a fair description. There are eighteen positions in all, each for a 7.9 machine gun! They are are disposed as follows: two in the upper part of the front doors; two in the under part of the front doors; four forward dorsals behind the pilots' cockpit; six lateral; two dorsal rear; and two ventral rear. Guards are fitted where necessary to prevent the gunners hitting the structure of the aircraft.

Armour protection is concentrated in the pilots' cabin, which has dual controls, side-by-side seating and is located forward of the leading-edge of the wing. The radio operator's cabin is actually inside



"The Junkers 290 may be considered a development of the Ju 90 series, but is a larger aircraft." It has four BMW 801 L-2 engines.

the main spar, on the port side. Two flight engineers are carried, each having his own cabin in the leading-edge of the wing, from which he has control over the three engines on his side of the aircraft. Armour protection for the engineers could be seen on one aircraft.

Some heavy and bulky cargoes were ferried from Italy to Tunisia by Me 323s. About 100 troops is a fairly normal load for moderate distances; an 88 mm. Flak gun with accessories is another typical load.

It is true that the transport *staffeln* operating these aircraft suffered very heavy casualties in the weeks preceding the fall of Tunis and Bizerta, but that does not prove that the Me 323 is a bad transport aircraft. Any other aircraft designed for a similar purpose would have met the same fate when opposed by swarms of Kittyhawks, Lightnings and Spitfires. In any case, there are signs that the number of Me 323s in the *Luftwaffe* is increasing, and that much of the work hitherto done by Ju 52s will in future be allocated to these aircraft, though doubtless they will be supplemented by versions of the Ju 52, Go 244, Ju 290 and Ju 252.

Certainly the Me 323 is a type worth watching, if only because of its possibilities for post-war operation as a freighter or aerial charabanc, cheap in initial cost and economical to operate.

The Ju 290, of which there were two examples (one near Tunis and the other up at Bizerta) is more orthodox in conception but embodies some novel features which might be worth the attention of our own designers now that they are getting to work on big transports.

This machine has been captioned in the German Press as "Ju 90 S." The motive of the Germans in deliberately mis-captioning the many excellent photographs of the type is not clear, but was possibly designed to confuse the issue in the matter of recognition. This is not the first occasion on which something of this sort has occurred; a fighter, for instance, which is officially known in the *Luftwaffe* as the He 100 was labelled in the Press "He 113."

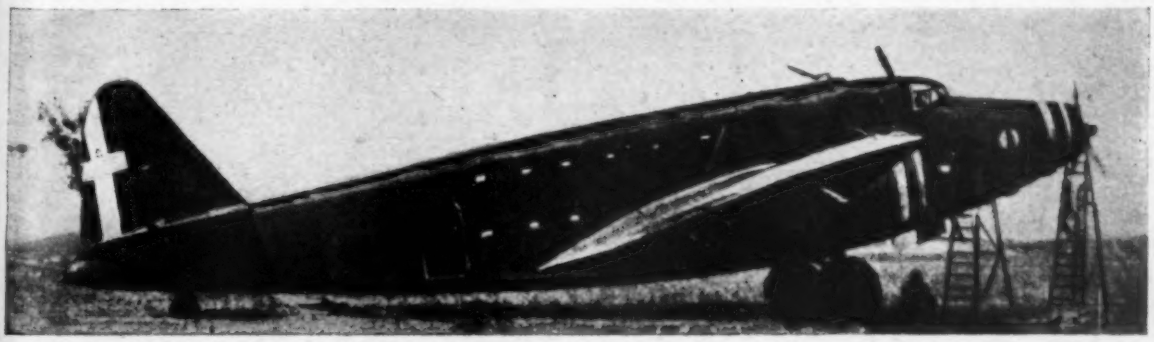
The Ju 290 may be considered as a development of the Ju 90 series, but is altogether a larger aircraft and of much greater power. The better specimen of the Ju 290a in Tunisia was on the Sidi Ahmed airfield at Bizerta, where it appeared to have overshot badly in landing on the main runway, colliding with an embankment at the edge of the field and tearing off the nose of the fuselage and the engines.

"Flying Flatfish" Glanform Disappears

As a concession to the Junkers production engineers the cantilever two-spar wing has a parallel centre-section and tapering outer panels. The "flying flatfish" wing, which was a legacy from the G.38 to the original Ju 90, has been abandoned. Slotted flaps are fitted, but not the "double-wing" variety as used on the Ju 52. The tail unit has twin fins and rudders of angular shape at the extremities of a broad cantilever tailplane with a pronounced dihedral angle.

As on certain other large German aircraft (Fw 200C, Bv 142) there are four main wheels; these retract hydraulically into the inboard engine nacelles, which are, accordingly, of massive proportions.

The stressed-skin fuselage is broad and deep. A heavy loading ramp is built into the bottom, being hinged at its forward end and lowered and raised by a mechanically-operated jacking mechanism. When the ramp is down, the tail of the aircraft is raised from the ground to provide clearance for loading. Running along the centre of the ramp is a flight of steps for the convenience of passengers, and on each side of this is a wheel track, enabling vehicles



The Savoia S.M.82 has three Alfa-Romeo engines (Bristol Pegasus type) "blown" to 6,000ft. only so as to get good take-off power.

TUNISIAN "AERO SHOW"

to be driven or hauled aboard. Extension pieces can be hooked to the bottom of the ramp to flatten the path of the vehicles, and there is a bridge which fits between the upper end of the ramp and the fuselage floor when the ramp is lowered.

For moving the ramp there is a shaft which extends well forward under the floor of the main cabin and which appears to be rotated by a little two-cylinder engine. This also operates a winch for hauling heavy loads up the ramp.

The maximum load, indicated by stowage instructions painted inside the cabin, was 8.5 metric tons.

For a transport aircraft the armament was unusually heavy: there were six MG 15 guns firing laterally through windows; one MG 151/20 on a manually operated mounting in the tail; and one MH 151/20 in the dorsal turret. A gun was also mounted in the ventral position, which is carried well forward under the fuselage. There is no apparent provision for carrying a bomb load in the Ju 290.

The engines are four BMW 801 L-2, which are generally similar to the A series, as fitted in the Do 217E, but they are specially rated for use in transport aircraft. They are mounted on tubular aluminium alloy structures which terminate in four ball-and-socket joints.

In each wing are two self-sealing petrol tanks, giving a total capacity of 7,200 litres (1,584 gals.). The fuel can be jettisoned by means of CO_2 bottles.

There was little novelty to be found among the Ju 52s; they were the old familiar freighters and troopers with corrugated skin; three BMW 132 A direct-drive radials with two-blade airscrews; large loading doors and fixed unfaired undercarriage.

Undoubtedly they did a good job in ferrying two tons or so of petrol, stores or personnel apiece, although whole formations of them met a fiery fate over the Mediterranean. Some were fitted with a glider-towing hook incorporated in the tailwheel, and at least one had a massive ring—similar to that on the Wellington—for detonating magnetic mines.

Italy had something more modern to show in the way of three-engined transports: the S.M.82 and Fiat G.12. The Savoia is undeniably a good transport aircraft, and the Germans apparently realise this, for crosses and swastikas appeared on a few of these machines. Due largely to Handley Page slots and slotted flaps, and to Bristol Pegasus type engines—actually Alfa-Romeo 128 RC 18—the "82" will carry about 3 tons and will cruise at 170 m.p.h.

Towed gliders were represented by this Go 242 twin-boom type, and by the D.F.S.230 shown on the next page.

Some readers may not appreciate the significance of the symbols following the type number of an Italian aircraft engine. For what it is worth, the explanation is that "R" indicates "geared"; "C" "Supercharged"; and the figures—when multiplied by 100—give the rated altitude of the engine in metres. So the Alfa engines on this big Savoia are "blown" to only 1,800 m., allowing the high take-off output desirable in transport aircraft.

Civil Conversion

As indicated by the comparatively small dimensions of its fuselage, the Fiat G.12 was originally designed for civil use. It was, in fact, intended for high-altitude Alpine crossings. The engines are somewhat unusual for a transport aircraft in that they are fully supercharged Fiat A.74 RC 42s, similar to those installed in the G.50, MC 200 and other Italian fighters. These small-diameter 14-cylinder radials give a fairly high top speed (over 240 m.p.h. at 14,000ft.), but the freight load is comparatively small, at something over 3,000 lb. The three-piece wing, as on some other Italian types, is of steel tube construction

The Fiat G.12 was originally designed as a commercial aircraft for high-altitude Alpine crossings. It has three fully-supercharged Fiat A.74 R.C. 42 engines.

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and is partly metal- and partly fabric-covered.

Another three-engined transport which was originally developed for civil use and was pressed into service by the Italians was the SM 75. With three Alfa-Romeo 126 RC 34 9-cylinder radials, this has a much greater disposable load than the G 12, but is not so fast. It resembles the military SM 82 in many superficial respects, but is, in fact, a rather different aircraft, particularly in the design of the wing.

To ease the pressure on their air transport organisation, the Germans pressed into service Fw 200Cs and Ju 90s as petrol- and freight-carriers. Even Ju 88s and Me 110s with external jettisonable tanks brought petrol to the hard-pressed North African forces. Full use was also made of the load-carrying capacity of the Bv 222 six-engined flying boat; unfortunately, no examples of this aircraft were captured. The latest version has six BMW 801 engines and is quite heavily armed.

The D.F.S.230 glider is more conventional in design than the Go 242, of which a picture appears on the previous page.

Towed gliders were represented by the twin-boom 79ft. Go 242 and the smaller and more conventional D.F.S.230.

The New Version of the Liberator

THE Liberator, which has proved its versatility by its employment as a cargo and transport aircraft (in the latter version known as the C.87), has undergone innumerable design changes, and appears now in the Allied air offensives in its latest form. The different stages of development of the Liberator have been marked mainly by variations in the defensive armament of the aircraft. The Liberator I had gun turrets amidships, while on the Liberator II the defensive armament remained the same, the only modification being an internal one, dispensing with the flight engineer and giving the pilot a full panel of instruments and controls. On the Liberator III the mid-ship gun turret was moved forward and placed between the leading-edges of the wings and the cockpit roof.

A further variation on the same theme was provided by different armament in Liberators in British and American employment. The R.A.F. Liberator III has a tail turret armed with four .303 Brownings; two flexible machine guns on each side of the fuselage; two in the top turret, and two or three in the nose. The American types carried two .5 American Brownings in the tail turret, and similarly one gun on each side of the fuselage; two .5 in top and two or three guns in the nose.

This formidable defensive fire power of the Liberator has now been further increased by the modifications carried out in the Willow Run plant. The new version of the Liberator, powered with Buick-built twin-row Wasps of 2,000 h.p., is equipped with an Emerson nose turret and a retractable underslung ball turret. The Emerson turret, resembling the equipment of British four-engined bombers, can be mounted either in the tail or the nose and is so constructed as to give the gunner an unrestricted field of vision of almost 300 deg. A screen of armour-piercing bullets at a rate of 2,000 per minute is fired from the Emerson.

While the Liberator III has a bomb load of about 8,000 lb., fuel, range and altitude modifications on the new version are said to have increased it further. It is even claimed that the latest version of both the Fortress and the Liberator carry as much as ten tons of bombs! In addition to the bomb-bay the new Liberator is reported to carry a two-ton block-buster slung underneath each wing.

PER DERBY

IN certain daily papers last week a cabled message announced that "a new type Rolls-Royce aero engine with a two-speed two-stage supercharger, devised by British and Packard engineers, has been in volume production for some months. . . ." This form of message diverts a great deal of credit which is rightly due to British engineers, as the engine in question is the Rolls-Royce Merlin 61 initiated by the world-famous Derby firm and is entirely British. It was described in detail and illustrated in *Flight* of December 17th, 1942. Actually the first engine with two-stage supercharger was running in this country as long ago as March, 1941, and flying in July of that year. It has been in operational use on British aircraft for some months, and constitutes one of the greatest engineering achievements of modern times.

Now fitted to the P 51 Mustang in U.S.A., it has raised the ceiling of that excellent aircraft by over two miles.

AD ASTRA

Last week *Flight*, on page 220, drew attention to a somewhat similar misquotation—for misquotation it must have been, since we know Peter Masefield to be too knowledgeable and well informed to describe the Packard-built Rolls-Royce engine as "the literal saviour of England." As we have already observed, the first Packard engine built to Rolls-Royce drawings did not appear until many months after the Battle of Britain.

These are but two examples of exaggerated claims which serve no good purpose at a time when technical achievement is more the painstaking goal of British engineers than boasting. Undoubtedly we need greatly improved methods of propaganda to convey to our American friends what this country is actually doing; it is a regrettable fact that the U.S. Press is in the main noticeably silent about British technical attainments in the aeronautical sphere.

Leaded Aircraft Fuels

A Study of the Response of Aircraft Fuels to the Admixture of Tetraethyl Lead : Gains from Isooctane Plus Tetraethyl Lead

EXCEPT for a small quantity of special-purpose fuel, all aviation petrols used to-day contain some tetraethyl lead. The susceptibility of the various petrol constituents to tetraethyl lead is, therefore, an integral part of the characteristics which determine the limits of performance.

An interesting contribution to the study of the response of aircraft fuels to tetraethyl lead has recently been made by A. G. Cattaneo and A. L. Stanly, of the Shell Development Co., in a discussion before the American Chemical Society.

As Cattaneo and Stanly point out, to this fact justice is only rarely done. After considerable effort on the part of all industries concerned, it has become possible to measure the anti-knock value of petrol within a few tenths of an octane number, but the susceptibility of a petrol to tetraethyl lead is still expressed by such vague terms as "poor," "fair," or "good." Thus the interpretation is left to the individual, and comparison of results is impossible.

The reason for this situation lies in the complexity of the response to lead. The rise in octane number on any one fuel is different for each cubic centimetre of tetraethyl lead added. Also, the shape of the curve is different for fuels of the same octane number and different lead response as well as for fuels of different octane number but equal lead response. Fig. 1, in which conventional lead-response curves are plotted for a number of common fuels, shows these effects clearly.

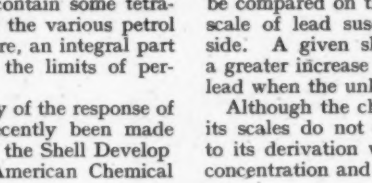

Fig. 1. Tetraethyl lead—c.c. per gallon lead susceptibility curve (A.S.T.M.-C.F.R. method).

By far the most confusing element, however, is the non-uniformity of the octane scale. An 85-octane fuel, showing an increase of 15 octane numbers from the addition of 3 c.c. of tetraethyl lead, is considered to have a good lead susceptibility, but a 50-octane fuel, showing an equal increase in octane number, is not. This is because an increase from 85 to 100 octane number is more than twice as effective in terms of engine performance as an increase from 50 to 65 octane number.

The Ethyl Blending Chart

In 1933, Hebl, Rendel, and Garton (In. Eng. Chem., 25, 187, 91) first showed an empirical way to deal with this situation. On the ethyl blending chart which they proposed, the horizontal scale of c.c. tetraethyl lead per gallon and the vertical scale of octane number were so chosen that a lead response curve becomes a straight line. This was later revised for A.S.T.M.-C.F.R. motor method octane numbers, and also to take better account (by the use of slanting ordinates) of the effect of the anti-knock value of the base stock upon the relation between lead concentration and increase in compression ratio. Fig. 2 shows the data of Fig. 1 entered upon the revised chart.

This chart has been in use for several years, and has been found reliable for lead concentrations up to 3 c.c. per gallon. For higher concentrations of tetraethyl lead the chart is useful but is not so well established, partly owing to lack of sufficient data and partly to the large influence which small variations in the sulphur content may have, particularly in the region above 60 octane number. Below 3 c.c. of tetraethyl lead the chart can be considered more reliable than any one individual octane number determination.

The slope of the lines representing two petrols can easily be compared on this chart, either visually or by use of the scale of lead susceptibility marked along the right-hand side. A given slope—i.e., lead susceptibility—represents a greater increase in octane number for a given addition of lead when the unleaded fuel is of low octane number.

Although the chart has been developed empirically, and its scales do not suggest any obvious relations, reference to its derivation will show that the relation between lead concentration and octane number was obtained by elimination from expressions relating both to compression ratio. While the relative size of octane numbers used in the ethyl blending chart is thus linked to a specific engine factor, further confirmation of its significance should be looked for.

One such source of confirmation, say Cattaneo and Stanly, is found in the rating of fuels on a supercharged C.F.R. engine operated at a fixed compression ratio. The anti-knock value of a fuel is found by increasing the intake manifold pressure under constant operating conditions of speed, temperature, and air fuel ratio, until incipient detonation occurs. The rating of the fuel could be expressed in terms of permissible manifold pressure, or indicated mean effective pressure, but it is preferable to refer in some way to a reference fuel in order to eliminate engine, atmospheric, and personal variations. A convenient expression proposed by Boerlage, Peletier, and Tops (Aircraft Eng. 7, 306, 8) is "allowable boost ratio," defined as

A.B. ratio = manifold pressure (abs.) at incipient detonation for test fuel / manifold pressure (abs.) at incipient detonation for reference isooctane.

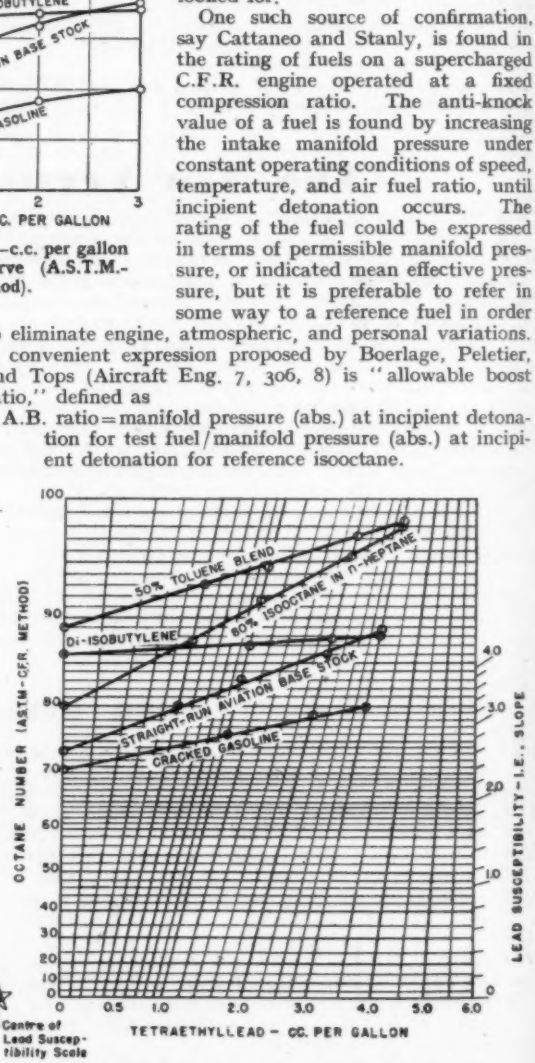

Fig. 2. Tetraethyl lead—c.c. per gallon ethyl blending chart.

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In each case mixture strength was adjusted to give maximum thermal plug temperature.

In Fig. 3 the A.B. values of standard reference fuels (n-heptane-isooctane blends) are plotted against their octane numbers. When the octane number scale is adjusted so as to give a straight-line relation, as in Fig 4, the relative size of the single octane numbers becomes nearly the same as that found from their relation to compression ratio on the A.S.T.M.-C.F.R unit, although the cylinder size and operating conditions of the supercharged engine were all different.

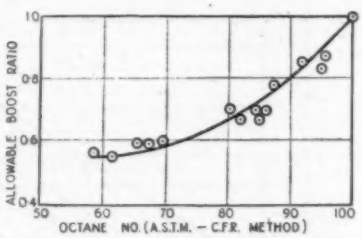


Fig. 3. Octane No. (A.S.T.M.-C.F.R. method). Octane number vs. allowable boost ratio. Supercharged C.F.R. engine, 2⅞in. dia. cylinder, 1,800 r.p.m., 7 : 1 compression ratio, 330° F. jacket.

The same relative size of octane numbers appears to hold under other test conditions as well. The relation is not precisely the same for all methods of test, but no radical deviations have been found in the dozen or so different laboratory methods that have been studied by Cattaneo and Stanly.

From the preceding example it might also be thought that the value of isooctane plus tetraethyl lead units would also remain the same relative size under different test conditions. This, however, is not the case, as can be seen from Fig. 5, which contains lead susceptibility curves derived under four different conditions of test.

Above 100-octane Numbers

Although the ethyl blending chart was originally designed for fuels below 100 octane number, it is increasingly evident that the study of aircraft fuels must take account of anti-knock quality higher than that figure represents; in fact, the co-operative organs of the interested industries are actively studying various methods of expressing such anti-knock values. Meanwhile, expressions such as 120 octane number are often seen in the Press. Such figures have no meaning so long as the method of extrapolation is not stated. From Figs. 3 and 4 it is evident that a harmonious extrapolation using octane numbers would be non-linear, the size of a single unit becoming continually greater; and it has been estimated that an absolute ceiling would be reached in the neighbourhood of 130 octane number. It appears preferable to use a more linear scale and one which has no arbitrary upper limit, yet it should be expressible in terms of a reference fuel in order to facilitate interpretation of new data and comparison with data already available. Up to 100 octane number the A.S.T.M. standard reference fuels can be used, and above 10 c.p. isooctane (2, 2, 4-trimethylpentane) plus specified quantities of tetraethyl lead is the most readily available and easily understood reference.

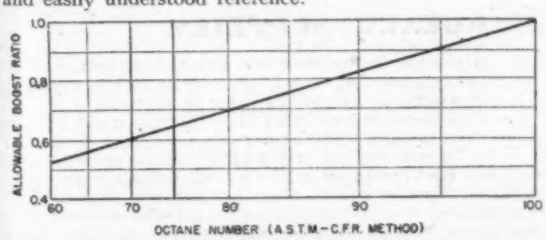


Fig. 4. Octane number (A.S.T.M.-C.F.R. method). Octane-number scale from Fig. 3, adjusted to give straight line.

To extend the ethyl blending chart (A.S.T.M.-C.F.R. method) into this region by the method used in its derivation, it would be necessary to determine the compression ratio at standard knock intensity for these various blends of isooctane plus lead. However, in this region of high compression ratios, the high sensitivity of the bouncing pin (which results from the high-compression pressure and steep - combustion pressure rise) is a disturbing factor. Further, the vertical adjustment of the C.F.R. cylinder head for a given difference in compression ratio becomes smaller as the compression ratio increases. These two factors prevent an accurate extension of the chart by this method.

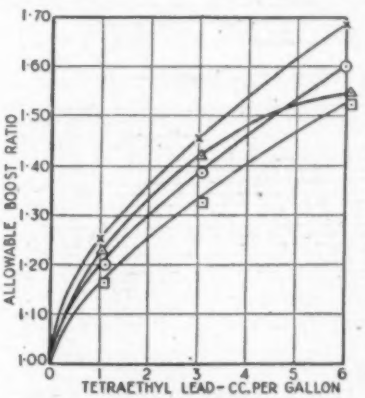


Fig. 5. Tetraethyl lead—c.c. per gallon. Four test methods for lead susceptibility of 150 octane on the supercharged C.F.R. engine.

○ 2⅛in. cyl. plain intake valve, 1,800 r.p.m., 7 : 1 comp. ratio.
× 2⅛in. cyl. shrouded intake valve, 1,800 r.p.m., 7 : 1 comp. ratio.
△ 2⅛in. cyl. shrouded intake valve, 900 r.p.m., 7 : 1 comp. ratio.
□ 3¼in. cyl. shrouded intake valve, 1,800 r.p.m., 7 : 1 comp. ratio.

Another approach is evident, say Cattaneo and Stanly, if it is considered that the extension would have a tetraethyl lead scale on both the horizontal and the vertical axis of the chart. Hence, if only the slope of the line representing isooctane were known, the intersections of that line with the abscissæ representing lead concentration would determine the ordinate scale.

Fig. 6 shows the lead susceptibility lines for isooctane-n-heptane blends containing 0, 70, 85, 90 and 95 volume per

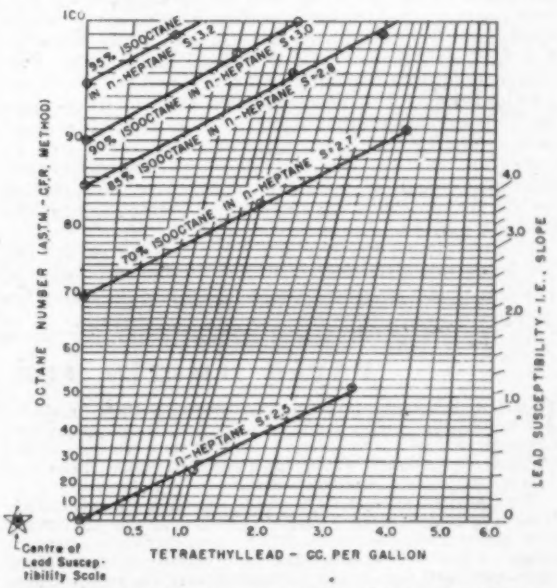

95% ISOOCTANE IN n-HEPTANE S=3.2
90% ISOOCTANE IN n-HEPTANE S=3.0
85% ISOOCTANE IN n-HEPTANE S=2.8
70% ISOOCTANE IN n-HEPTANE S=2.7
n-HEPTANE S=2.5
OCTANE NUMBER (A.S.T.M.-C.F.R. METHOD)
LEAD SUSCEPTIBILITY – I.E., SLOPE
TETRAETHYLLEAD – CC. PER GALLON
Centre of Lead Susceptibility Scale

Fig. 6. Tetraethyl lead—c.c. per gallon. Lead susceptibilities of Isooctane-*n*-Heptane blends.

LEADED AIRCRAFT FUELS

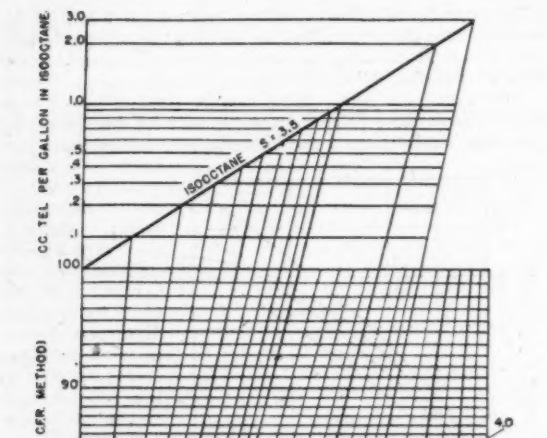

CC TEL PER GALLON IN ISOOCTANE
ISOOCTANE S = 3.5
OCTANE NUMBER (ASTM - CFR METHOD)
LEAD SUSCEPTIBILITY - I.E., SLOPE
Centre of Lead Susceptibility Scale
TETRAETHYLLEAD - CC. PER GALLON

Fig. 7. Tetraethyl lead—c.c. per gallon. Extended ethyl blending chart.

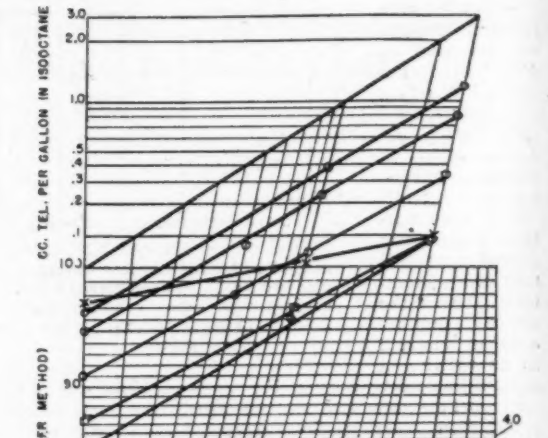

CC. TEL. PER GALLON IN ISOOCTANE
OCTANE NUMBER (ASTM-CFR METHOD)
LEAD SUSCEPTIBILITY - I.E., SLOPE
Centre of Lead Susceptibility Scale
TETRAETHYLLEAD - CC. PER GALLON

Fig. 8. Tetraethyl lead—c.c. per gallon. Verification of extended ethyl blending chart.

cent. isooctane, respectively, and having slopes of 2.5, 2.7, 2.8, 3.0 and 3.2. By extrapolation a slope of 3.5 seems most likely for pure isooctane. On Fig. 7 the isooctane line has been drawn with this slope through the 100-octane-number clear point of the chart, and the isooctane-plus-lead ordinates have been drawn horizontally through the intersections of that line with the abscissæ of lead concentration.

The final verification of the extended chart must come from its accuracy in application. The several fuels plotted on Fig. 8 show that good alignment is obtained and hence that the extension is valid.

It is surprising to note how large are the gains from small amounts of tetraethyl lead. The difference between 100 octane number and isooctane plus 0.2 c.c. tetraethyl lead is about equal to that between 95 and 100 octane number. The gain from unleaded isooctane to isooctane plus 3 c.c. tetraethyl lead is about equal to that from 75 to 100, or from 0 to 75 octane number.

On the supercharged C.F.R. engine the indicated power output is substantially proportional to the manifold pressure at constant-mixture strength, and, therefore, the power output at incipient detonation for any given fuel is proportional to its allowable boost ratio. If we call the power output possible on isooctane 100 per cent., then under a certain set of engine conditions isooctane plus 3 c.c. tetraethyl lead permits, say, 140 per cent. power, and a 75 octane number fuel 65 per cent. (Fig. 4).

We are indebted for the diagrams to the American Chemical Society and the Shell Development Co.

PAPER 'CHUTES FOR EMERGENCY SUPPLIES

PAPER parachutes to be used in dropping drugs, food and supplies in emergencies, are to be issued to operating bases of the Provincial Air Service in Canada if they can be modified to meet requirements, Frank MacDougall, Deputy Minister of Lands and Forests, recently stated.

The parachutes, manufactured by a Canadian concern, have been tested by George Ponsford, director of the air service, who has suggested improvements to meet bush-flying requirements. Ponsford found, he said, the speed at which the 'chute is released from the aircraft was important. The tests included dropping the parachutes with loads of 10, 20 and 30 pounds. "I think if the improvements we suggested are incorporated in the parachute, it has some use with this department," he said. It is assumed that these improvements include some form of reinforcement to prevent the paper from tearing.

Mr. MacDougall, a bush pilot himself, pointed out that the 'chutes were not intended to carry heavy loads. "However," he said, "if you are lost in the bush and the rescue aircraft could not land except on a lake a long distance away, you'd be glad of even 10 pounds of food or medical supplies if you were injured. I hope the parachutes will also save our pilots from trying to land on lakes which are too small for safety. Some of them, anxious to bring aid to lost or injured people in the bush, have taken that kind of chance."

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

TECHNICAL TRAINING

"A Voice Crying in the Wilderness"

REGARDING Mr. Geoffrey Smith's excellent letter (*Flight*, August 26th) on aeronautical studies, I am glad he has put the case so clearly and trust the "Powers-that-be" will take due notice. I am afraid until recent months he has been "a voice crying in the wilderness." N. R.

Pre-war Examples at Edinburgh

THE subject of civil aviation is at last beginning to receive same tangible recognition in our post-war planning, but as yet the mass of the population is entirely vague when it comes to an understanding of air matters.

That this should be so is highly undesirable, considering the vital issues bound up with the future development of aviation.

In some quarters, educational courses in aviation have been suggested, and this seems an excellent idea to put into action at once.

What may be of interest to some people and will come as a surprise to most is the fact that in Edinburgh, before the war, a course in aviation was in existence and proved very popular. This course was unique in that it was part of the city's evening classes curriculum, thus bringing aviation into the sphere of ordinary educational subjects.

There were various sections in the course, according to the knowledge of the individual student, and, besides the practical side of flying (including maintenance), instruction dealt with the more general aspects of aviation such as air transport.

Unfortunately, on the outbreak of war, like so many other things, it came to a sudden end. Nevertheless, after the war is over, it will almost certainly be possible to take a university degree in aeronautics, either at an ordinary university or one devoted exclusively to the science of aeronautics.

Consequently, it is apparent that instruction, though perhaps of a less technical nature, should be available at other centres. Also, whereas university aeronautics will probably have to wait till the war ends, something could be done now to provide those interested with an elementary knowledge of aviation.

This would help greatly towards a better understanding of problems upon which depends the future economic and social security of the whole world. J. H.

R.A.F. Ignore Government Scheme

I HAVE read with great interest Mr. Geoffrey Smith's letters in the *Daily Telegraph* and the various letters and articles in *Flight* (which my son takes regularly) on this subject, and I would like to bring to your notice another field for finding suitable personnel to fill the dearth in the aircraft industry after the war.

My son's great ambition is to become an aeronautical engineer and he achieved very high honours in his general school examination and only just failed in getting the Higher School Certificate a year later. As he was approaching military age, owing to the lack of facilities in the aeronautical world and his desire to continue his engineering studies, he applied for and was granted a Government engineering cadetship.

Now there are thousands of cadets like him throughout the country with strong leanings towards aeronautical engineering. This side was, of course, stressed at the various selection boards at which he attended. One of these boards consisted of high officers from each of the three Services. Candidates were very closely examined and only those with suitable qualifications were accepted. In my son's case he expressed a desire to serve in the Fleet Air Arm so that he would keep in touch with the aeronautical side.

Imagine the disappointment of these lads when they had a talk recently with an army officer and were informed that the R.A.F. would have nothing at all to do with the scheme, and that the majority of the cadets would be used by the army. He further suggested that they had many more cadets than required, and there would be a severe weeding out process at various stages of the course.

Here lies the point. Why have high Naval and R.A.F. officers on the selection board if those Services are not interested? Secondly, would it not be feasible, and indeed advisable, to form an aeronautical cadre of suitable cadets to serve with the flying services with a view to their continuing in the aeronautical industry after the war? D. G. FRANCIS

(Ex-Officer R.N.A.S. and R.A.F., 1916-19).

"WHISPERING DEATH"

The "Silent Zone" of Aircraft

BEING an invalid (temporary acting, I hope!), I have much leisure time in which to observe the considerable aerial activity which goes on over Southern England. I have often noticed that the engine roar of a low-flying Beaufighter approaching head-on only becomes audible when the aircraft is right on top of one. I can appreciate the slightly dramatic name that the Japanese soldiery are alleged to have given the "Beau" as a result of its very effective beat-ups of their columns.

Other aircraft have similar characteristics. For example the Martlet seems to have a silent zone dead astern. I have stood behind one on an airfield and, except for an increased draught, never known it was taking off. JOHN CHAMIER.

Exhaust Collector Gives Silent Approach

I HAVE been reading the letter from "Hercules" in the August 19th issue of *Flight* and think perhaps I can put forward the explanation of the term "Whispering Death" applied by the Japanese to the Bristol Beaufighter equipped with admittedly powerful Hercules engines.

A feature of all Bristol engines to date has been the forward type exhaust collector which not only collects the exhaust gases but also forms the leading edge of the cowling. This collector is of considerable size and acts as a reasonably efficient silencer.

It has often been noted that oncoming aircraft—equipped with Bristol engines—are extremely silent, and it is only when the machines have passed that the noise from the exhaust, which is led aft by a tailpipe from the collector, is heard.

Doubtless this is the explanation "Hercules" is looking for. "RODNEY."

REVERSIBLE-PITCH AIRSCREWS

Blade Tips of Relatively Minor Importance

FURTHER to "Driver's" second letter in your August 12th issue, I must point out that I did not argue against the use of "negative props" as landing run shorteners—indeed they have proved quite effective in this respect. All I did was to point out the fallacy of "Driver's" contention regarding the relative efficiency of positive and negative pitch.

His reasoning on the pitch of the blade tip is quite sound, but as the criterion of the screw action is determined by the condition at the centre of thrust of each blade, the fact of blade tips being sympathetic or antipathic to the main pitch condition during pitch change is of relatively minor importance.

The itemised statement that during initial acceleration "normal props" are "shockingly inefficient anyway" is apparently contradicted by the second statement of a Blenheim IV getting off at Gibraltar in "positive coarse pitch." Gibraltar airfield is not the largest one in Europe by any means, and from my experience of Blenheims anyone who can take off and climb away in "coarse" and get away with it is a favourite of the gods. I'm not.

If "Driver" has ever flown an aircraft upside down he will know that considerable forward stick has to be maintained to keep the nose well "up," and so give the wings "positive" incidence to maintain lift, but it can by no means be termed efficient.

Marine screws cannot very well be compared with airscrews as the blade design and operating medium and conditions are so dissimilar. Marine screw blades are not of aerofoil section, and if "Driver" has the opportunity of examining the Rotol v.p. marine screw blades, he will see that they are of nearly symmetrical profile and chord section.

I should also welcome the comment of a professional "wind-tunnel wallah" on the comparable efficiency of a reversed airscrew condition to a normal airscrew condition for similar pitch angles and power input. I think my "bit of unproved and unconsidered generalisation" might be upheld.

"B. HAMPTON-COURT."

SERVICE AVIATION

FOR NAVAL OCCASIONS: The Curtiss Seagull (U.S. Navy designation SO3C-1) is known to the Fleet Air Arm of the Royal Navy as the Seamew. The engine is a Ranger inverted vee air-cooled of 520 h.p.

Royal Air Force and Fleet Air Arm News and Announcements

Promotions

GENERAL DUTIES BRANCH.

Air Commodores to be Acting Air Vice-Marshals.
M. THOMAS, C.B.E., D.F.C., A.F.C., August 2nd, 1943.
C. E. V. PORTER, August 1st, 1943.

Retirement

TECHNICAL BRANCH.

Air Comdre. R. G. PARRY, C.B., D.S.O., is placed on the retired list at his own request, and retains the rank of Air Vice-Marshal. August 12th, 1943.

Awards

Fleet Air Arm

THE KING has been graciously pleased to approve the following awards:—

For gallantry in air operations in defence of a convoy to Malta:—

Distinguished Service Cross

Act. Temp. Lt. Cdr. (A) R. A. BRABNER, D.S.O., M.P., R.N.V.R.

FOR skill and daring in shooting down an enemy aircraft while operating from H.M.S. *Battler* on convoy escort duty:—

Distinguished Service Cross

Sub. Lt. (A) P. CONSTABLE, R.N.

Mention in Despatches

Temp. Sub. Lt. (A) A. G. PENNEY, R.N.V.R.

Royal Air Force

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy:—

Distinguished Service Order

Wing Cdr. G. D. JONES, D.F.C., No. 97 Sqn.—This officer has displayed inspiring leadership, great skill and unflagging devotion to duty, which has been reflected in the many successes obtained by the squadron he commands.

Act. Wing Cdr. D. T. SAVILLE, D.F.C., No. 218 Sqn.—This officer has completed a very large number of sorties. By his personal example and high qualities of leadership, this officer has contributed materially to the operational efficiency of the squadron.

Act. Sqn. Ldr. T. W. BLAIR, D.F.C., R.A.F.V.R., No. 83 Sqn.—Sqn. Ldr. Blair has taken part in a large number of sorties, most of which have been against heavily defended targets, including the industrial centres of the Ruhr and Berlin. Sqn. Ldr. Blair has unerringly guided his aircraft to far distant targets, such as Spezia, often in the face of adverse weather.

Act. Sqn. Ldr. E. F. K. CAMPLING, D.F.C., No. 460 (R.A.A.F.) Sqn.—Sqn. Ldr. Campling is a first-class pilot who has rendered fine service. He has completed very many sorties, including four attacks on Berlin.

Act. Sqn. Ldr. E. K. CRESWELL, D.F.C., R.A.F.V.R., No. 35 Sqn.—This officer has a fine record of achievement, having undertaken a large number of sorties, involving attacks on heavily defended areas in the Ruhr, on ports both in enemy and enemy occupied territory, and on far distant targets, such as Turin and Spezia in Italy.

Act. Sqn. Ldr. R. A. WELLINGTON, D.F.C., R.A.F.V.R., No. 83 Sqn.—This officer has completed a large number of sorties, including 18 attacks on the Ruhr area. His efforts throughout have been characterised by a keen desire to bomb his targets determinedly and accurately.

Flt. Lt. A. P. CRANSWICK, D.F.C., No. 35 Sqn.—This officer has taken part in a very large number of sorties, involving attacks on targets in Germany, occupied territory, Italy, and in the Middle East.

THE growth of the R.A.F. and the increasing number of deeds of valour have proved too much for our supply of paper. With great regret we must omit citations for the awards of D.F.C. and D.F.M., but when a bar to either is awarded the original citation will be quoted.

F/O Michael Wedgwood Benn, son of Lord Stansgate, is a night-fighter pilot and has been awarded the D.F.C.

Second Bar to Distinguished Flying Cross

Act. Wing Cdr. C. M. MILLER, D.F.C., R.A.F.V.R., No. 29 Sqn.—Since Wing Cdr. Miller took over command of the squadron six enemy aircraft have been destroyed and two damaged. Wing Cdr. Miller completed a large number of night operational patrols during this period, many of them in adverse weather, and personally destroyed two enemy aircraft. He received the D.F.C. in January, 1941, and was awarded a Bar in February, 1941.

Sqn. Ldr. J. A. F. MACLACHLAN, D.S.O., D.F.C.—Recently these officers in the course of an operation over enemy occupied territory shot down six enemy aircraft, three of which were destroyed by Sqn. Ldr. MacLachlan and two by Flt. Lt. Page, while the other was destroyed jointly. The operation was planned by Sqn. Ldr. MacLachlan.

Bar to Distinguished Flying Cross

Act. Wing Cdr. W. J. ALINGTON, D.F.C., A.F.C., No. 264 Sqn.—On one sortie this officer damaged seven locomotives. More recently, in June, 1943, he led a formation of light bombers on an operation which resulted in the destruction of four enemy aircraft on the ground, while much damage was caused to a hangar. In addition, a mine-sweeper was attacked and damaged.

Flt. Lt. J. A. SPENCE, D.F.C., R.C.A.F., No. 277 Sqn.—In June, 1943, this officer undertook a flight to search for a pilot who was adrift in his dinghy in the English Channel. He succeeded in locating the dinghy some two and a half miles from the French coast. The sea was exceedingly rough, but Flt. Lt. Spence brought his aircraft down safely on to the water, then taxied to the airman who, after a strenuous effort, was hauled aboard. Owing to the heavy seas, it was not possible for the aircraft to take off again, so, disregarding enemy minefields in the vicinity and the possibility of attack from the air, Flt. Lt. Spence resourcefully taxied his aircraft across the Channel to a home base.

Act. Flt. Lt. A. W. FRASER, D.F.C., R.A.A.F., No. 120 Sqn.—This officer was the captain of an aircraft which attacked a U-boat. In the face of heavy anti-aircraft fire a vigorous attack was pressed home and the vessel was destroyed. Although Flt. Lt. Fraser's aircraft was hit by

gunfire, he flew it to base where he executed a masterly landing.

Maj. J. E. FROST, D.F.C., S.A.A.F., No. 5 Sqn. (Deceased).—Within a very short period this officer trained his squadron to a high degree of efficiency. While operating with a wing the unit inflicted heavy casualties on the enemy in the air and in low-level attacks on objectives on the ground. Maj. Frost has destroyed two enemy aircraft and damaged several others.

Act. Sqn. Ldr. A. L. WINSKILL, D.F.C., R.A.F.V.R., No. 232 Sqn.—Sqn. Ldr. Winskill has completed a very strenuous tour of duty, and has led his squadron on a very large number of sorties in the North African theatre of war. On one occasion his aircraft was shot down into the sea, and on another he was forced to leave it by parachute because the engine caught fire. Since the award of the D.F.C. this officer has destroyed one enemy aircraft and shared in the destruction of another in the air; in addition he has destroyed two on the ground and completed many successful attacks on enemy transport and machine-gun posts.

Act. Sqn. Ldr. E. F. K. DENNY, D.F.C., R.A.F.V.R.—This officer completed a number of operational sorties over enemy territory from England before being posted to North Africa. During that period he was awarded the D.F.C. During the Tunisian battle he took part in operational duties with keenness and determination, personally navigating the leading aircraft in numerous formation attacks.

Act. Flt. Lt. A. MacP. OGILVIE, D.F.C., R.A.F.V.R., No. 83 Sqn.—In air operations, these officers have displayed courage and fortitude worthy of the highest praise.

Act. Sqn. Ldr. V. C. WOODWARD, D.F.C., R.A.F.O., No. 213 Sqn.—Since the award of the D.F.C. in April, 1941, this officer has destroyed nine enemy aircraft, bringing his total victories to twenty. Sqn. Ldr. Woodward has a fine record of achievement, displaying at all times outstanding courage and devotion to duty.

Act. Wing Cdr. R. C. ALABASTER, D.F.C., R.A.F.V.R., No. 97 Sqn.—One night in July, 1943, Wing Cdr. Alabaster was captain and navigator of an aircraft, piloted by Flt. Lt. Clarke, detailed to attack Cologne. Some fifty miles from the target the bomber was attacked by an enemy fighter. Before it could be evaded the aircraft was repeatedly hit. One engine was damaged, other structural essentials almost shot away, while the rear gunner was wounded and his turret rendered unserviceable. The bomber became difficult to control, but, despite this, course was reset for the target, which was attacked successfully. On the return flight, shortly after crossing the enemy coast, the damaged engine caught fire, and could not be extinguished but Flt. Lt. Clarke flew on to the nearest airfield to effect a masterly landing. This pilot displayed outstanding skill and tenacity, while Wing Cdr. Alabaster's high navigational skill and excellent captaincy proved a valuable contribution to the success of the operation.

Act. Sqn. Ldr. R. W. McNAIR, D.F.C., R.C.A.F., No. 421 (R.C.A.F.) Sqn.—This officer is a skilful and determined fighter. Sqn. Ldr. McNair has destroyed ten hostile aircraft (five of them whilst serving in the Middle East) and damaged a number of others.

Flt. Lt. J. M. BRYAN, D.F.C., R.A.F.V.R., No. 137 Sqn.—Flt. Lt. Bryan is a skilful and tenacious pilot. Since being awarded the D.F.C. he has damaged two minesweepers, three barges and an E-boat. In addition he has executed thirteen destructive attacks on locomotives; he has also participated in several successful attacks on enemy airfields.

Flt. Lt. J. Y. MALLEY, D.F.C., R.A.F.V.R., No. 178 Sqn.—This officer has completed a large number of sorties in the European and Middle East theatres of war, invariably displaying cool determination in attacking his targets. In August, 1942, Flt. Lt. Malley was navigator in the leading aircraft of a formation which attacked shipping in Tobruk Harbour by daylight, achieving excellent results despite intense anti-aircraft fire.

Distinguished Flying Cross

Flt. Lt. A. G. PAGE, R.A.F.V.R.—For citation see Sqn. Ldr. MACLACHLAN, D.S.O., D.F.C.

F/O. G. C. CROWTHER, R.C.A.F., No. 420 (R.C.A.F.) Sqn.—For citation, see Flt. Lt. Ogilvie, D.F.C. and bar.

Flt. Lt. A. E. CLARKE R.A.F.V.R., No. 97 Sqn.—For citation see Wing Cdr. Alabaster, D.F.C. and Bar.

Act. Sqn. Ldr. P. BUNCLARK, D.F.M., No. 78 Sqn.

P/O. J. GOOD, R.A.A.F., No. 467 (R.A.A.F.) Sqn.

F/O. J. F. HANDASYDE, R.A.A.F., No. 53 Sqn.

Act. Flt. Lt. H. C. WILKIE, R.N.Z.A.F., No. 15 Sqn.

F/O. J. HALL, R.A.F.V.R., No. 77 Sqn.

Act. Flt. Lt. D. M. BALME, R.A.F.V.R., No. 207 Sqn.

Act. Flt. Lt. F. O. DIMBLEBEE, R.A.F.V.R., No. 273 Sqn.

F/O. J. L. DE HOUX, R.C.A.F., No. 137 Sqn.

Wing Cdr. R. F. H. CLERKE, No. 125 Sqn.

Act. Flt. Lt. L. W. WATTS, R.A.F.V.R., No. 616 Sqn.

F/O. P. D. WOOD, R.A.F.V.R., No. 605 Sqn.

F/O. R. T. MERRIFIELD, R.A.V.R., No. 53 Sqn.

F/O. G. F. WOOD, R.A.A.F., No. 53 Sqn.

Wing Cdr. O. GODFREY, No. 103 Sqn. (Deceased).

Act. Wing Cdr. W. L. THOMAS, No. 114 Sqn.

Sqn. Ldr. H. J. V. ASHWORTH, R.A.F.V.R., No. 218 Sqn. (Deceased).

Sqn. Ldr. P. J. R. KITCHIN, No. 75 (N.Z.) Sqn. (Deceased).

Act. Sqn. Ldr. I. G. ESPLIN, R.A.F.V.R., No. 29 Sqn.

Act. Sqn. Ldr. T. HOGGARD, D.F.M.

SERVICE AVIATION

Act. Sqn. Ldr. P. de L. LE CHEMINANT, No. 114 Sqn.

Act. Sqn. Ldr. T. C. MCGILLIVRAY, No. 156 Sqn. (Deceased).

Flt. Lt. G. N. DAWSON, No. 26 Sqn. (Deceased).

Flt. Lt. R. A. HAGGER, R.A.F.V.R., No. 72 Sqn.

Flt. Lt. J. P. M. LINTOTT, R.A.F.V.R., No. 85 Sqn. (since deceased).

Flt. Lt. C. W. MILLER, No. 97 Sqn. (Deceased).

Flt. Lt. J. G. PATTISON, R.N.Z.A.F., No. 485 (N.Z.) Sqn.

Act. Flt. Lt. R. M. BRINSLEY, R.A.A.F., No. 93 Sqn.

Act. Flt. Lt. A. J. CHILD, R.A.F.V.R., No. 35 Sqn. (Deceased).

Act. Flt. Lt. B. E. GALE, R.A.A.F., No. 111 Sqn.

Act. Flt. Lt. W. R. MAITLAND, R.A.F.V.R., No. 156 Sqn. (Deceased).

Act. Flt. Lt. I. G. S. MATTHEW, R.A.F.V.R., No. 91 Sqn.

Act. Flt. Lt. H. G. PILLING, R.A.F.V.R., No. 7 Sqn. (Deceased).

Act. Flt. Lt. J. K. PORTEOUS, R.N.Z.A.F., No. 243 Sqn.

Act. Flt. Lt. H. RHODEN, R.A.F.V.R., No. 78 Sqn. (Deceased).

Act. Flt. Lt. J. W. S. SMITH, R.A.F.V.R., No. 601 Sqn.

Act. Flt. Lt. D. SMYTH, R.A.F.V.R., No. 614 Sqn.

Act. Flt. Lt. W. A. TURTLE, No. 214 Sqn. (Deceased).

Act. Flt. Lt. D. R. I. WALLACE, R.A.F.V.R., No. 614 Sqn.

"THE TIME HAS COME." Sea Cadets on holiday at a R.N. air station enjoy flights in a Supermarine Walrus.

F/O. N. J. BRIANT, No. 98 Sqn. (Deceased).

F/O. J. A. BUSH, R.A.F.V.R., No. 114 Sqn.

F/O. H. CAMERON, No. 114 Sqn.

F/O. W. J. CORBIN, R.A.F.V.R., No. 72 Sqn.

F/O. H. C. CRAFT, R.A.F.V.R., No. 418 Sqn.

F/O. L. C. DORWARD, R.A.A.F., No. 97 Sqn. (Deceased).

F/O. A. S. DREDGE, R.A.F.V.R., No. 183 Sqn.

F/O. N. DUMONT, R.N.Z.A.F., No. 614 Sqn.

F/O. J. A. ESLER, R.A.F.V.R., No. 86 Sqn. (Deceased).

F/O. J. FORTUNE, R.A.F.V.R., No. 208 Sqn. (Deceased).

F/O. D. E. HOGAN, R.N.Z.A.F., No. 111 Sqn.

F/O. H. C. KELSEY, R.A.F.V.R., No. 141 Sqn.

F/O. A. H. J. PALMER, R.A.F.V.R., No. 29 Sqn.

F/O. L. A. PLUMMER, R.A.F.V.R., No. 232 Sqn.

F/O. K. G. RAYMENT, R.A.F.V.R., No. 153 Sqn.

F/O. W. SERVICE, No. 114 Sqn.

F/O. R. R. SMART, R.A.F.V.R., No. 605 Sqn.

F/O. R. F. STARNES, R.A.F.V.R., No. 232 Sqn.

F/O. R. W. STORY, R.A.F.V.R., No. 18 Sqn.

F/O. J. D. YOUNIE, R.A.F.V.R., No. 241 Sqn.

P/O. J. D. N. BAIN, R.C.A.F., No. 156 Sqn.

P/O. P. COPELAND, R.A.F.V.R., No. 250 Sqn. (Deceased).

P/O. G. G. GILLING-LAX, R.A.F.V.R., No. 83 Sqn. (Deceased).

P/O. S. S. MARTIN, R.C.A.F., No. 103 Sqn. (Deceased).

P/O. W. I. H. MAGUIRE, R.A.F.V.R., No. 81 Sqn.

P/O. G. MCAULEY, R.A.F.V.R., No. 218 Sqn. (Deceased).

P/O. W. R. B. MCCARTHY, R.A.A.F., No. 218 Sqn. (Deceased).

P/O. R. W. MEDUS, R.A.F.V.R., No. 218 Sqn. (Deceased).

P/O. E. F. MORTON, R.C.A.F., No. 418 Sqn.

P/O. J. P. MUIRHEAD, R.A.F.V.R., No. 12 Sqn. (Deceased).

P/O. T. R. R. WOOD, R.A.F.V.R., No. 115 Sqn. (Deceased).

W/O. A. W. GEAR, R.A.F.V.R., No. 72 Sqn.

W/O. P. E. MERRALLS, No. 106 Sqn. (Deceased).

Flt. Lt. M. O'CONNOR, R.A.A.F., No. 38 Sqn.

Capt. R. C. HOJEM, S.A.A.F., No. 5 (S.A.A.F.) Sqn.

Capt. W. L. O. MOON, S.A.A.F., No. 2 (S.A.A.F.) Sqn.

F/O. S. D. PLUMMER, R.A.F.V.R., No 230 Sqn.

F/O. E. G. PULLEN, R.A.F.V.R., No. 23 Sqn.

W/O. R. S. JONES, No. 23 Sqn.

Maj. J. P. DE VILLIERS, S.A.A.F., No. 24 (S.A.A.F.) Sqn.

Maj. J. A. MOUTON, S.A.A.F., No. 21 (S.A.A.F.) Sqn.

Act. Sqn. Ldr. L. E. LEON, R.A.F.V.R., No. 223 Sqn.

Act. Sqn. Ldr. H. B. NICKOLLS, R.A.A.F., No. 223 Sqn.

Act. Flt. Lt. G. C. BARWELL, R.A.F.V.R., No. 178 Sqn.

Act. Flt. Lt. D. H. HANNAH, R.A.A.F., No. 55 Sqn.

F/O. D. J. BELLINGHAM, R.A.F.V.R., No. 178 Sqn.

F/O. D. BOYD-STEVENSON, No. 104 Sqn.

F/O. B. F. FERMOR, R.A.F.V.R., No. 223 Sqn.

F/O. G. O. LACE, R.A.F.V.R., No. 23 Sqn.

F/O. M. SMITH, R.A.F.V.R., No. 70 Sqn.

P/O. R. A. WILD, R.A.A.F., No. 112 Sqn.

W/O. W. B. GINGELL, D.F.M., No. 223 Sqn.

F/O. G. H. AVENT, R.C.A.F., No. 40 Sqn.

F/O. D. T. BAIN, R.C.A.F., No. 408 (R.C.A.F.) Sqn.

F/O. L. STEPHENSON, R.A.F.V.R., No. 153 Sqn.

F/O. G. A. HALL, R.A.F.V.R., No. 153 Sqn.

F/O P. G. K. WILLIAMSON, No. 153 Sqn.

Distinguished Flying Medal

Flt. Sgt. R. NIVEN, No. 53 Sqn.

Flt. Sgt. K. C. RIDLEY, No. 263 Sqn.

Sgt. R. E. HEAP, No. 10 Sqn.

Sgt. F. C. HEAVERY, No. 467 (R.A.A.F.) Sqn.

Sgt. E. R. J. HOGG, R.N.Z.A.F., No. 49 Sqn.

Sgt. A. G. HOLMES, No. 103 Sqn.

Sgt. J. H. HUDSON, No. 50 Sqn.

Sgt. H. HUMPHREYS, No. 7 Sqn.

Sgt. T. F. E. JOHNSON, No. 44 Sqn.

Sgt. J. KEDDIE, No. 97 Sqn.

Sgt. L. R. KING, No. 404 (R.C.A.F.) Sqn.

Sgt. W. T. LAMBERT, No. 102 Sqn.

Sgt. J. MCCREADIE, No. 106 Sqn.

Sgt. A. M. MACDIARMID, No. 49 Sqn.

Sgt. N. G. MCDONALD, R.A.A.F., No. 50 Sqn.

Sgt. J. S. MCPHEE, No. 166 Sqn.

Sgt. D. W. MEPHAN, No. 15 Sqn.

Sgt. (now Act. Flt. Lt.) J. G. MOORE, No. 50 Sqn.

Sgt. J. A. MULLANY, No. 207 Sqn.

Sgt. J. NAIRN, No. 101 Sqn.

Sgt. C. R. PEARCE, R.N.Z.A.F., No. 428 (R.C.A.F.) Sqn.

Sgt. G. A. POTTER, No. 15 Sqn.

Sgt. L. PROUD, No. 103 Sqn.

Sgt. R. MCG. RITCHIE, No. 161 Sqn.

Sgt. A. J. W. SILK, No. 97 Sqn.

Sgt. A. SHORT, No. 166 Sqn.

Sgt. A. SYMMONS, No. 77 Sqn.

Sgt. A. S. THOMPSON, No. 51 Sqn.

Sgt. A. VALLINS, No. 115 Sqn.

Sgt. V. G. K. WALTERS, No. 101 Sqn.

Sgt. T. S. WARDLE, No. 103 Sqn.

Sgt. W. H. WATCOTT, No. 10 Sqn.

Sgt. (now P/O.) R. J. WELLER, No. 78 Sqn.

Sgt. L. T. WHEELER, No. 207 Sqn.

Sgt. W. H. WIDGER, No. 103 Sqn.

Flt. Sgt. (now P/O.) B. R. FROST, No. 114 Sqn.

Sgt. R. BUSH, No. 142 Sqn. (Deceased).

Sgt. (now P/O.) W. F. CALDWELL, No. 9 Sqn. (Deceased).

Sgt. J. V. CARLILE, No. 360 Sqn. (Deceased).

Sgt. N. H. HOOD, No. 35 Sqn. (Deceased).

Sgt. J. ROUGH, No. 114 Sqn.

Sgt. L. A. SEAMARK, No. 142 Sqn. (Deceased).

Sgt. E. M. SMITH, R.A.F.V.R., No. 141 Sqn.

Sgt. C. MCK. GOUDY, R.C.A.F., No. 77 Sqn.

Sgt. D. MACM. SMITH, R.C.A.F.

Flt. Sgt. D. A. SIBBOLD, No. 35 Sqn.

Flt. Sgt. (now P/O.) S. A. WOODS, No. 104 Sqn.

Sgt. A. P. WALKER, No. 23 Sqn.

Flt. Sgt. H. A. POMEROY, No. 53 Sqn.

Sgt. A. J. AMES, No. 75 (N.Z.) Sqn.

Flt. Sgt. J. V. F. FOULSTON, No. 51 Sqn.

Flt. Sgt. L. M. BROOM, R.A.A.F., No. 223 Sqn.

Flt. Sgt. W. H. HAWKINS, No. 8 Sqn.

Flt. Sgt. F. L. NATTRASS, R.A.A.F., No. 223 Sqn.

Flt. Sgt. W. C. TUCKER, R.A.F.V.R., No. 55 Sqn.

Sgt. (now P/O.) J. GREENSHIELDS, R.C.A.F., No. 70 Sqn.

Sgt. M. G. MCMANUS, No. 23 Sqn.

Sgt. J. YOUNG, No. 178 Sqn.

Sgt. D. S. LAKE, No. 153 Sqn.

Flt. Sgt. C. R. DAVIES, R.A.A.F., No. 14 Sqn.

Flt. Sgt. C. H. SIMMONS, No. 14 Sqn.

Sgt. D. FOSTER, No. 40 Sqn.

Sgt. W. J. BARBER, No. 158 Sqn.

Sgt. J. W. E. LAWRENCE, No. 158 Sqn.

THE KING has been graciously pleased to approve the following awards:—

O.B.E. (Mil.)

Act. Wing Cdr. J. FARMER.—While *en route* from Singapore to Batavia, the ship on which he was travelling was torpedoed by an enemy submarine. The vessel carried explosives. Wing Cdr. Farmer, assisted by two of the ship's crew, organised personnel on board and improvised rafts. The vessel sank about an hour later, the submarine remaining in the vicinity until then. After about 18 hours in the water the survivors were rescued by a naval vessel.

SERVICE AVIATION

M.B.E. (Mil.)

F/O. J. VERNEY, R.A.F.V.R.—One night in April, 1943, a Whitley aircraft crash-landed and burst into flames. F/O Verney was thrown clear, but received superficial wounds on the face, head and legs, and suffered from shock. Sgt. Gough managed to extricate himself from the rear turret and proceeded to the front of the aircraft, where he found the pilot and bomb-aimer lying together in the wreckage. The latter was on fire, but was pulled to safety and passed to another member of the crew by Sgt. Gough. This airman then returned to assist the pilot, who was pinned from the waist downwards. Ignoring his own safety, Sgt. Gough made heroic attempts to release the pilot despite the flames and ammunition which was bursting in the front turret. He only desisted in his efforts when his harness, flying suit and hair were burning. F/O. Verney, who was suffering considerably, made several valiant attempts to go to the aid of Sgt. Gough, but became exhausted by his efforts, and finally collapsed, being dragged away by another member of the crew. He was taken to a nearby residence, where he displayed commendable coolness and fortitude in making his report of the accident and in attending to the needs of the other survivors.

Bar to Air Force Cross

Flt. Lt. G. C. BRUNNER, A.F.C.—In 1943, Flt. Lt. Brunner was engaged in testing an aircraft. During the flight serious trouble developed. Flt. Lt. Brunner took immediate remedial action, but, despite this, one of the engines commenced to emit large quantities of smoke and oil. A course was set for base, but smoke started to enter the cockpit, and the aircraft entered a steep dive. Efforts to rectify this were at first unavailing, but eventually partial control was regained after much height had been lost, and Flt. Lt. Brunner succeeded in reaching an airfield, lowered his under-carriage and landed successfully. Through his skill and courage, a valuable aircraft was saved from complete destruction, and this enabled the cause of the failure to be ascertained.

George Medal

Flt. Sgt. D. M. COATES, R.C.A.F., No. 415 (R.C.A.F.) Sqn.—In November, 1942, Flt. Sgt. Coates was the wireless operator/air gunner in an aircraft which crashed into a petrol dump and a lorry when landing after an arduous sortie over the Bay of Biscay. The entire scene became an inferno of blazing petrol and exploding ammunition, and there was imminent danger of the detonation of a torpedo which was in the aircraft. The navigator was pinned by the legs and unable to free himself. Displaying great persistence and complete disregard for his personal safety, Flt. Sgt. Coates succeeded in extricating the navigator. He then went to the aid of the pilot, who was also pinned by the legs and unconscious, and endeavoured to release him until his own face and wrists were too severely burned to permit him to continue. Throughout his heroic endeavours to release the pilot, Flt. Sgt. Coates faced the risk of sudden death. It was only when the intensity of the conflagration surpassed human endurance that he left the aircraft, and, even then he assisted the navigator whom he had rescued to move further away to safety.

Sgt. J. F. CLARK, No. 59 Sqn.—One night in March, 1943, Sgt. Clark was the wireless operator/air gunner in a Fortress aircraft which crashed and caught fire on the top of a hill in conditions of poor visibility. Sgt. Clark and three other members of the crew escaped with minor injuries, and Sgt. Clark realised that three further members of the crew were in the wreckage. Despite the blazing petrol tanks and the presence of explosives which he knew were in the aircraft, he immediately re-entered the fuselage and, with the assistance of L.A/C. French, who had arrived at the scene after having seen the flames from his bedroom, dragged the three airmen from the wreckage. Some time afterwards an explosion occurred, shattering the aircraft and breaking glass a quarter of a mile away.

Military Medal

Sgt. J. BRADLEY, No. 10 Sqn.
Sgt. J. W. MACFARLANE, No. 10 Sqn.

Air Force Medal

Flt. Sgt. J. H. COLLINS and Sgt. H. H. PARKER, both of No. 51 Sqn.—While returning from an operational sortie, the aircraft in which Flt. Sgt. Collins and Sgt. Parker were flying as captain and bomb-aimer respectively, developed a fault in one engine and was unable to gain height. On heading out to sea the aircraft was engaged by heavy anti-aircraft fire, the petrol tanks and a second engine were set on fire. Preparations were made to descend on the sea. While the aircraft was approaching the water, another hit was sustained, which killed the wireless operator and severely wounded Sgt. Parker. Flt. Sgt. Collins succeeded in bringing the aircraft down on to the water, gaining time for the rest of the crew to board the dinghy. Sgt. Parker continued his duties during the descent and helped in the transfer of the crew before he informed his companions of his wound.

B.E.M. (Mil.)

Sgt. P. GOUGH.—For citation see F/O. Verney, M.B.E.

L.A/C. A. FRENCH.—For citation see Sgt. Clark, G.M.

Sgt. A. BARRIE, No. 51 Sqn.—One night in April, 1943, a Blenheim aircraft crashed and burst into flames. The aircraft had been seen to dive by Sgt. Barrie, who hurried across fields to the scene three-quarters of a mile away. He scrambled down a steep cutting to get to the aircraft, and as he reached it an explosion occurred which broke it in two. He then saw the pilot who was in the wreckage. Sgt. Barrie took off his own tunic and, after wrapping it round his head, entered the burning wreckage. He was able to drag the badly wounded pilot away to safety. Sgt. Barrie then returned to the blazing wreckage and searched for other survivors until he was satisfied that there were no others who could still be alive. His unselfish heroism was responsible for saving the pilot's life.

L.A/C. G. H. CHASTNEY.—A Bisley aircraft, carrying mails, crashed when taking off, and immediately burst into flames. L.A/C. Chestney rushed to the scene of the accident and found the wireless operator trapped in the burning wreckage. Displaying complete disregard for his own safety whilst working for several minutes directly beneath a burning petrol tank which was liable to explode, he succeeded in releasing the wireless operator. L.A/C. Chestney's courage and devotion to duty undoubtedly saved the airman's life.

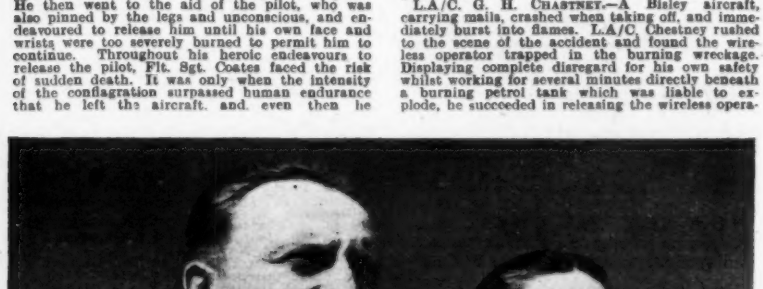
L.A/C. H. GARFORTH and L.A/C. E. J. WHITE, both of No. 462 Sqn.—One night in April, 1943, a Wellington aircraft was returning from operations and, when landing on the airfield, bombs which had not been released exploded, causing the bomber to disintegrate in flames. L.A/C.s Garforth and White, who were on duty at the station as ambulance driver and nursing orderly respectively, proceeded to the scene. L.A/C. White immediately went to the rear turret and succeeded in extricating the gunner, who was badly injured and whose clothes were smouldering. In the meantime L.A/C. Garforth had prepared his ambulance and brought a stretcher up to the blazing wreckage. Their prompt action in entering the area of the burning wreckage is worthy of high praise, and undoubtedly enabled them to save the life of the air gunner.

A/C.1 C. G. B. KAPP.—In March, 1943, a Beaufighter aircraft crashed. A/C. Kapp, who was on leave, left his house and was the first to arrive at the scene. The aircraft was on fire and the pilot, who was injured, was trapped in the wreckage by his parachute harness. Despite the fire and consequent risk from exploding petrol tanks, A/C. Kapp heroically persisted until he succeeded in extricating the pilot, whose clothing had by then caught fire.

A/C.2 H. KAY.—One afternoon in May, 1943, a Beaufighter aircraft crashed and caught fire when landing on an airfield. A/C. Kay immediately drove his ambulance to the scene and endeavoured to rescue the pilot, who was trapped and badly injured. As the heat was intense this airman put on his cap and coat and finally succeeded in extricating the pilot; in so doing A/C. Kay sustained burns to his forehead. After receiving treatment for the burns A/C. Kay returned to his ambulance and took the injured pilot to hospital.

A/C.2 J. KENNEDY.—In March, 1943, a Wellington aircraft crashed on an airfield and caught fire. A/C. Kennedy, accompanied by two other members of his gun post, immediately went to the scene of the accident. On arrival A/C. Kennedy climbed on to the rear of the fuselage and, after breaking away the perspex of the rear gun turret, he succeeded in extricating the air gunner. A/C. Kennedy then went to the front of the aircraft and, assisted by his two comrades, succeeded in extricating another member of the crew who was unconscious. By this time the aircraft was enveloped in flames and A/C. Kennedy was compelled to abandon his rescue efforts; this he did just before the starboard petrol tanks exploded. The courage and initiative displayed by this airman undoubtedly saved two lives.

Sgt. J. P. H. O'NEILL, No. 158 Sqn.—Sgt. O'Neill was captain and pilot of a Halifax aircraft carrying high explosive bombs and incendiaries which crashed and burst into flames shortly after taking off for an operational mission. Some members of the crew were trapped in the blazing wreckage, and although Sgt. O'Neill was himself severely injured and burned and in a fainting condition through loss of blood, he resolutely refused to leave the scene of the accident. Disregarding his own injuries, he worked unsparingly, directing and helping civilians in an attempt to save others in the wreckage. Without thought for himself, his efforts ceased only when he became unconscious.



D.S.O. AND D.F.C.: Act. Wing Cdr. C. Patrick Green, D.F.C., has recently been awarded the D.S.O., and his observer, F/O. Gillies, the D.F.C. for outstanding skill and determination in air fighting over Sicily. In three successive nights they destroyed seven enemy aircraft.

Awards of Foreign Decorations

Royal Air Force

THE KING has granted unrestricted permission for the wearing of the undermentioned decorations conferred on the personnel indicated, in recognition of valuable services rendered in connection with the war:—

Conferred by the President of the United States of America

Legion of Merit

Group Capt. C. A. BELL.
Group Capt. G. H. RANDLE.

Silver Star

Act. Group Capt. R. H. WATERHOUSE, D.F.C., A.F.C.
Wing Cdr. G. E. HARRISON, No. 149 Sqn.
Act. Wing Cdr. H. H. BURNELL, No. 7 Sqn.
Sqn. Ldr. W. V. CRAWFORD-COMPTON, D.F.C., R.A.F.V.R., No. 453 Sqn.
Sqn. Ldr. E. F. J. CHARLES, D.F.C., No. 611 Sqn.

Distinguished Flying Cross

Act. Wing Cdr. K. L. B. HODSON, D.F.C., R.C.A.F.
Act. Wing Cdr. T. R. HOPE, D.F.C., No. 58 Sqn.
Flt. Lt. G. H. T. HATTON, R.A.F.V.R.
Act. Flt. Lt. R. A. BUCKHAM D.F.C., R.C.A.F., No. 416 (R.C.A.F.) Sqn.
Act. Flt. Lt. J. A. WAKEFORD, D.F.C., R.A.F.V.R., No. 9 Sqn. (since reported missing).
W/O. W. GREENFIELD, No. 277 Sqn.

Air Medal

Sqn. Ldr. D. W. STEVENTON, D.S.O., D.F.C., No. 541 Sqn.
Flt. Lt. W. A. PREST, R.C.A.F., No. 122 Sqn.
Act. Flt. Lt. S. TREVALLION, R.A.F.V.R., No. 278 Sqn.
F/O. G. A. MASON, R.A.F.V.R., No. 222 Sqn.
F/O. G. PLATTS, R.A.F.V.R., No. 541 Sqn.
F/O. D. F. WILSON, R.A.F.V.R., No. 542 Sqn.
W/O. T. McN. ORMISTON, No. 277 Sqn.
W/O. A. K. SAUNDERS, R.N.Z.A.F., No. 277 Sqn.
Flt. Sgt. G. N. LEIGHTON, No. 277 Sqn.

Soldiers' Medal

Flt. Sgt. R. E. RENNIE.
Cpl. I. A. C. STEELE.
Cpl. C. J. THORNE.
L.A/C. J. KING.
L.A/C. F. S. MILLINGTON.

Roll of Honour

Casualty Communique No. 271.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list 96 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. E. W. Cragg; F/O. J. H. P. Foster; Flt. Sgt. R. Harvey; Flt. Sgt. A. E. Hayden; Sgt. M. F. McCrea; Sgt. G. S. McCutcheon; Sgt. D. W. Somerville; Sgt. R. F. Tidmarsh; P/O. C. Warner.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Act. Sqn. Ldr. A. E. Berry, D.F.C.; W/O. C. R. K. Bools; Act. Flt. Lt. A. J. Child; Sgt. J. R. Cowan; P/O. E. F. Dowdell; Sgt. F. C. Evans; Sgt. V. R. French; Sgt. C. M. Howard; Flt. Sgt. E. J. Ironmonger; Sgt. G. W. Jackson; Sgt. P. K. Jones; P/O. R. L. Leith-Hay-Clark; Sgt. W. M. Mahaffy; Act. Wing Cdr. J. H. Marks, D.S.O., D.F.C.; P/O. F. A. Mitchell; Sgt. R. L. Moss; Flt. Sgt. R. Robertson; Sgt. C. W. Turner; Sgt. G. A. Walker.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. W. Anderson; P/O. R. W. Andrew; Sgt. R. F. Ashby; Flt. Sgt. E. R. Borsberry; Sgt. J. W. Clarke; Sgt. F. P. Coaker; P/O. W. Culmsee; Flt. Sgt. L. W. Deeth; Flt. Sgt. M. A. H. Demont; Sgt. T. Duffy; Sgt. N. J. Durkan; Sgt. H. Firth; Flt. Sgt. G. Glasgow; F/O. D. Goodman; Flt. Sgt. L. T. W. Grady; Sgt. M. Griffiths; Sgt. N. Henderson; W/O. F. E. M. Hicks; Sgt. H. E. Hothersall; Sgt. P. H. Jackett; Sgt. C. E. Jeffrey; Sgt. J. T. Jones; P/O. J. A. McLean; Sgt. J. C. Mason; Flt. Sgt. R. Mathews; Sgt. H. J. Morgan; Flt. Sgt. G. Nelson; Sgt. C. O'Callaghan; Sgt. J. G. J. Parrott; Sgt. F. L. Roleston; Sgt. A. C. Savory; Sgt. D. Smith; Sgt. J. E. Sullivan; Sgt. G. Stark; Sgt. A. E. Townsend; Sgt. J. Urwin; Sgt. S. R. Vowles; P/O. P. Walker; Sgt. W. E. R. Wareham; P/O. L. Wheatley; Sgt. P. L. Wheeldon; Sgt T. Whelan; Sgt. W. J. Wilkinson; Sgt. B. T. J. Woodland; Sgt. K. J. Yates.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Sgt. J. J. Anderson; Sgt. R. C. Balsdon; Sgt. A. E. Brodie; Sgt. A. D. Bulmer; Sgt. J. Burnside; W/O. D. C. C. Busby; Sgt. H. Buttrey; Sgt. J. M. Carroll; Flt. Sgt. P. A. Chapman; F/O. K. I. Dexter; Sgt. W. A. Dutton; Act. Sqn. Ldr. D. P. Fox, D.F.C.; Sgt. A. Glen; F/O. E. S. Hayes; Sgt. R. A. Heslop; Flt. Sgt. A. M. Johnson; Sgt. A. K. B. Kerrigan; Sgt. F. G. Lay-Flurrie; Sgt. J. G. Lumley; Sgt. R. F. Middlebrook; Sgt. G. M. Murray; Sgt. P. F. Nixon; W/O. D. H. Orchard; Sgt. R. G. Pope; Sgt. T. F. Potter; Sgt. R. C. Ridgway; Sgt. W. T. Shepherd; Flt. Sgt. A. S. Spires, D.F.M.; Sgt. H. Staples; Sgt. H. G. Thomas; Sgt. G. S. Underlina.

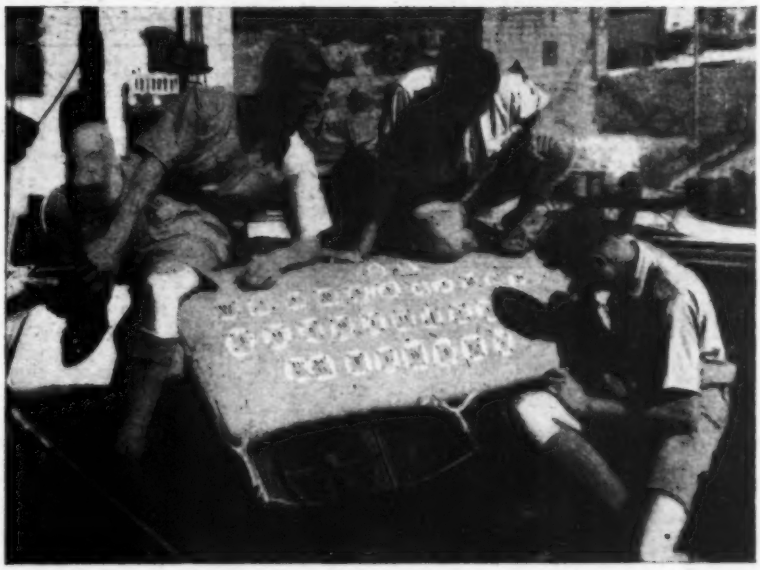
MISSING.—Sgt. J. A. Aldersley; Sgt. J. J. Anderton; Sgt. D. C. Bauman; Sgt. J. R. Bell; F/O. J. R. H. Bell; Sgt. F. J. Biddle; Sgt. G. C. Bird; P/O. R. C. Blythe; Sgt. E. W. A. Brice; Sgt. B. S. Bridge; Sgt. G. A. Burdett; Sgt. E. Cadmore; F/O. C. F. Callender; Sgt. D. E. C. Chambers; Sgt. N. W. S. Clack; F/O. J. A. Cowley, D.F.M.; Sgt. R. E. Crook; Sgt J. R. Curtis; Sgt. G. Davison; Sgt. J. A. G. Dawe; Sgt. R. F. A. Dobson; Sgt. W. J. Drake; Sgt R. C. Drinkwater; Sgt. C. T. O. Dudley; Flt. Lt. C. W. Dunnett; P/O. C. A. Edwards; Sgt. G. E. Evans; Sgt. G. W. G. Fletcher; Sgt. W. Forster; Act. Flt. Lt. A. F. Foster, D.F.C.; Sgt. S. M. Frost; P/O. W. S. Fyfe; Flt. Lt. C. V. J. Geary; Sgt. D. Glassman; Sgt. G. A. F. Green; Sgt. N. Greenwood; Sgt. C. E. Grimshaw; Sgt. G. R. Hale; Sgt. M. F. Haley; Sgt. P. Hall; Sgt. J. W. Harbidge; Sgt. A. R. Helliwell; Sgt. J. Hills; Act. Flt. Lt. S. G. Howe, D.F.C.; Sgt. R. S. Kerwin; Sgt. L. G. Ledamun; Sgt. F. Lee; Sgt. R. L. Lewis; Sgt. H. Love; Sgt. G. Luff; W/O. W. A. McCrodden; Act. Sqn. Ldr. J. C. Mackintosh; P/O. R. B. Miller; Sgt. A. Moon; Sqn. Ldr. M. W. E. Mulford; Sgt. J. A. Murray; L.A/C. S. Newman; Sgt. H. R. Nice; Flt. Sgt. V. J. Norman; Sgt. J. Nuttall; P/O. J. T. O'Brien; Sgt. G. S. Paterson; Flt. Sgt. F. C. Payne; Sgt. D. S. Phillips; Sgt. H. Popplestone; Sgt. H. F. Poynter; Flt. Sgt. C. P. Probst; P/O. A. W. Pullan; Sgt. R. E. Ratcliffe; Sgt. J. S. Riddell; P/O. L. Roberts; F/O. D. C. Sawyer; Sgt. R. M. W. Selby-Lowndes; Sgt. A. Selves; Sgt. H. F. Sheppard; Sgt. R. A. C. Showler; Sgt. C. J. Sinclair; Sgt. A. A. Smith; Sgt. R. G. Smith; Sgt. H. L. Smithson; Sqn. Ldr. G. G. Storey; Act. Sqn. Ldr. J. E. Swift, D.F.C.; F/O. D. O. Thomas; Sgt. J. Tweedie; Sgt. H. F. Upperton; F/O. J. W. Verney; Sqn. Ldr. A. de Q. Walker, D.F.C.; Sgt W. H. Waring; Sgt. E. E. Weare; Sgt. D. Webster; P/O. F. L. Williams; Flt. Sgt. P. Woodcock; Flt. Sgt. E. Wright.

KILLED ON ACTIVE SERVICE.—Sgt. F. U. Batchelor; Sgt. E. R. Broad; Sgt. P. R. Farnell; Sgt. W. Featherstone; Sgt. E. Kirk; Sgt. A. M. Milne; Sgt. R. W. E. Peacock; Sgt. H. D. G. Shaw; F/O. S. Vlatkin.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. W. H. Fardoe; Sgt. S. Hunter; Sgt. D. C. Smith.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. R. F. Faris; Sgt. C. H. Malkin; Sgt. N. A. Workman.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. J. R. Bazire.



THE GROWING LIST: A member of the crew of high-speed rescue launch No. 107 records the latest rescue on the splinter mattress. So far the score stands at 82, which includes enemy aircrews.

DIED ON ACTIVE SERVICE.—L.A/C. W. B. Blackhall; Cpl. L. Brown; Cpl. T. Colman; Cpl. J. E. S. Deverell; A/C.2 D. E. Clements; A/C.2 J. Creaney; Flt. Sgt. E. H. Emery; A/C.2 A. Fellows; P/O. J. H. Howell; L.A/C. E. J. Martin; L.A/C. A. E. Richardson; L.A/C. F. Smith.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—L.A/CW. N. Smith.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. C. H. Pierson; Sgt. M. S. Brighouse; Flt. Sgt. M. K. Burke; F/O. L. G. Lyons; Sgt. E. H. Riding; Sgt. G. Scribner.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. R. S. Christie; Flt. Sgt. A. J. Galley; Sgt. J. Heath; Sgt. P. J. Hogan; Flt. Sgt. N. A. P. Kane-Maguire.

MISSING.—F/O. B. W. Bennett; F/O. R. M. Bryant; Sgt. C. R. Buckeridge; Sgt. D. R. Grant; Sgt. J. J. Horwood; Flt. Sgt. G. E. Ising; Flt. Sgt. K. L. W. Lay; Sgt. S. J. Marriage; Flt. Sgt. B. J. Stanford.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. B. Fetell.

WOUNDED OR INJURED ON ACTIVE SERVICE.—P/O. G. F. Chapple.

Royal Canadian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. J. J. W. Adams; Sgt. A. E. Caton; Sgt. A. Holmes; Sgt. M. G. Low; Sgt. J. R. Morrow; Sgt. J. C. Scotten; Sgt. P. K. Zaparynuk.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. C. N. Chalklen; P/O. P. R. Eakins; Flt. Sgt. R. C. Fitzgerald; P/O. J. E. Gardiner; Flt. Sgt. J. W. Hutchinson; P/O. N. Monchier; Sgt. W. A. R. Moule; P/O. K. T. Pellett; Flt. Sgt. C. R. Spratt; P/O. L. A. Walker; Flt. Sgt. R. J. Williams.

WOUNDED OR INJURED IN ACTION.—Sgt. W. C. McQueen.

MISSING, BELIEVED KILLED IN ACTION.—F/O. H. E. Holbrook; Sgt. E. S. Rheume; Flt. Sgt. K. L. Spring; W/O. H. A. Tripp.

MISSING.—F/O. H. O. Bouchard; F/O. W. J. Boyce; Sgt. J. G. Breen; Sgt. M. E. Bunn; Flt. Sgt. W. M. Comba; P/O. J. P. Laurin; F/O. C. A. MacDougall; F/O. G. Miller; Flt. Sgt. E. J. Monk; Sgt. R. S. Morley; Sgt. C. A. Nash; Sgt. D. G. Tremblay; Flt. Sgt J. R. Wright.

KILLED ON ACTIVE SERVICE.—L.A/C. E. J. Dockendorff; Sgt. R. B. Hodges; Sgt. E. H. Johnston.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. R. D. Bijut.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. C. M. Gray; P/O. P. A. Vivian.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. J. D. Robb; Flt. Sgt. S. D. Wells.

MISSING.—W/O. R. J. Clarke.

DIED ON ACTIVE SERVICE.—Flt. Sgt. R. J. Grant.

South African Air Force

DIED ON ACTIVE SERVICE.—Lt. C. Cross.

Casualty Communique No. 272

Of the names in this list 91 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. D. S. Gent; Sgt. R. T. Harman; F/O. J. A. S. Harris; Sgt. D. J. D. Strath.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. J. De-La-W. Anstruther; Act. Flt. Lt. R. H. L. Dawson; P/O. J. C. F. Du Toit; Sgt. R. B. Greensmith; F/O. C. T. Holland; Sgt. D. N. Huntley, D.F.M.; Sgt. S. G. Jenner; F/O. C. H. Lovegrove; Sgt. K. L. Mathews; Sgt. P. C. Murphy; Sgt. C. J. Murray; Wing Cdr. M. F. B. Read; Sqn. Ldr. P. DeG. H. Seymour; Sgt. R. E. Williams.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. R. H. Alvey; P/O. G. H. Baker; Sgt. A. E. Bell; Sgt. R. Bell-Berry; Sgt. J. R. Bertram; Sgt. T. R. Bevan; Sgt. N. Bogard; Sgt. A. F. Boucher; Sgt. S. E. Bradshaw; Sgt. J. C. Brookes; Sgt. W. J. Bushell; Sgt. S. J. Butcher; Sgt. H. E. Chapman; Sgt. C. N. Coldicott; Sgt. R. J. Coles; Sgt. R. McG. Cormack; Sgt. E. G. Dodd; Sgt. R. H. Drew; Sgt. E. Dyson; Sgt. F. Dyson; Sgt. E. G. Edwards; Sgt. T. E. Edwards; Flt. Sgt. G. C. Everitt; Sgt. J. T. Fallon; Sgt. R. A. W. Hacker; Sgt. M. A. Harran; Sgt. D. W. Hepplewhite; Sqn. Ldr. J. R. D. Hird; Act. Flt. Lt. G. A. Ings; Sgt. G. Johnson; Sgt. R. Jones; Sgt. J. King; Sgt. J. J. Knight; Sgt. C. Lee; Sgt. C. Lyle; Sgt. D. R. Manser; Sgt. L. W. Morrison; Sgt. T. E. O'Connell; Sgt. A. Parsons; Flt. Sgt. L. A. Seamark; P/O. J. S. Shaw; Sgt. J. Thorpe; Flt. Lt. R. Tudor-Jones; Sgt. A. A. Waldie; Sgt. W. C. Warne; Sgt. H. Wigley; F/O. R. E. Williams; Sgt. S. Wilson; Sgt. A. V. Woolgar.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. C. McNair.

MISSING, BELIEVED KILLED IN ACTION.—P/O. G. D. Cockbone; Sgt. W. E. Cunliffe; Sgt. A. A. Gill; Sgt. F. N. Pink; Flt. Sgt. H. Shepherd; Sgt. L. Stephenson.

MISSING.—Sgt. T. Alexander; Sgt. F. Anderson; Sgt. J. Atkinson; Sgt. R. A. C. Avery; Sgt. A. C. Aylard; Sgt. G. A. Ayres; P/O. W. G. Bailey; Flt. Sgt. T. J. Bainbridge; Sgt. A. J. Banfield; Sgt. W. E. Barley; Sgt. L. R. Barrow; Sqn. Ldr. C. O. Bastian, D.F.C.; Sgt. W. H. Bellhouse; F/O. E. N. Billington; Flt. Lt. G. B. Boreham, D.F.M.; Sgt. E. B. Bottomley; Sgt. C. Boughton; Sgt. T. M. A. Burgess; F/O. M. W. P. Clarke; Sgt. J. E. Constable; Flt. Sgt. S. T. Cox; Sgt. A. Coull; Sgt. J. R. Cousins; P/O. E. F. Curtis; Sgt. C. C. Dabson; Flt. Sgt. J. M. Davies; Sgt. R. T. Davies; F/O. E. F. Davey; F/O. E. P. Deville; F/O. The Hon G. C. Douglas Home; Sgt.

K. B. Dowding; Sgt. B. J. Dowse; F/O. K. F. East, D.F.M.; Sgt. J. H. Elliott; Sgt. R. Ellison; Sgt. J. H. Emmett; Sgt. L. R. Evans; Sgt. R. Evans; Sgt. H. R. Fink; Sgt. S. L. Ford; Sgt. G. A. Freeman; Sgt. D. C. H. Fudge; Sgt. W. A. Gillanders; Sgt. R. P. Goward; Sgt. A. E. Gurney; Sgt. C. M. Harcombe; Sgt. M. Harris; F/O. S. E. Harris; Sgt. E. D. Hart; Sgt. J. W. Henderson; Sgt. R. Highet; Sgt. E. G. Hird; Sgt. H. E. J. Horton; Flt. Sgt. H. Humphreys; Sgt. J. L. Hyam; Sgt. W. E. Jackson; Sgt. D. J. Kingsworth; Sgt. H. J. P. Lackey; Sgt. A. W. Lee; Sgt. T. Leith-Ross; P/O. J. Lowrie; Sgt. T. R. Lunn; Sgt. H. J. Lygo; F/O. D. H. Lyne; Sgt. P. D. McArdle; Sgt. A. C. MacLeod; P/O. I. L. McDonnell; Flt. Sgt. F. D. McQuillan; Sgt. J. P. Martin; Sgt. F. M. Mazin; Sgt. P. E. K. D. Merry; Sgt. G. J. Morrice; Sgt. E. C. Nicholson; Sgt. J. A. Osborn; Sgt. J. W. Ousley; Sgt. D. E. Penn; Sgt. B. L. Pottage; Sgt. G. D. Prince; Sgt. W. G. Redman; Sgt. B. C. Reeves; Sgt. G. D. Reynolds; Sgt. D. Rudge; Sgt. J. Scott; Sgt. D. H. N. Slinger; Sgt. F. Smith; Sgt. A. F. Stephens; Sgt. M. W. Stone; Sgt. R. A. Stringer; P/O. C. Sugden; Sgt. R. Swain; Sgt. K. J. Tagg; Act. Flt. Lt. C. O. Taylor; Sgt. G. Taylor; Flt. Lt. W. M. Theobald; Sgt. S. E. Tuck; Sgt. G. W. Twitty; Sgt. E. C. Waite; Sgt. J. W. N. Westlake; Sgt. J. Walker; Sgt. M. R. Williams; Flt. Sgt. J. L. Wilson.

KILLED ON ACTIVE SERVICE.—Sgt. M. R. J. Arthurs; Cpl. T. Bond; Sgt. M. P. Brown; A/C.1 J. W. Cannon; P/O. D. F. Carter; Sgt. H. W. Cheshire; Sgt. J. R. Ellis; Sgt. M. Gardner; L.A/C. R. W. Glasscock; L.A/C. R. J. A. Goodman; Sgt. J. E. Hill; Sgt. R. H. E. Hollis; Sgt. H. Hooson; Sgt. A. D. Jenkins; Sgt. T. Kenningley; L.A/C. F. C. King; Sgt. W. N. Lancaster; Sgt. R. D. Landers; Sgt. E. Lax; Sgt. J. G. Lewis; L.A/C. H. V. Logan; Sgt. A. J. McKenzie; Sgt. D. H. Nicholls; L.A/C. C. K. Popple; W/O. F. W. Reed; Sgt. J. Roughley; Cpl. F. N. Sloss; Sgt. E. P. Stewart; Sgt. A. M. T. Temple-Murray; Ma/C. H. Thompson; L.A/C. C. Tudor; Sgt. J. S. Whitehead; Sgt. J. Whitehouse; Sgt. F. W. Wilcox; Flt. Lt. J. H. Willsher; Sgt. L. A. Willson; Sgt. N. Woodcock.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—A/C.1 J. McKinney; Sgt. R. C. Santley.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—L.A/C. W. R. MacKinnon; L.A/C. H. McKinnon; L.A/C. L. H. Prior.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. J. G. Adlam; Sgt. R. C. Cornfoot; L.A/C. W. A. B. Douglas.

DIED ON ACTIVE SERVICE.—A/C.1 J. Brocklehurst; A/C.1 R. Dodds; Cpl. M. Grundy; Sgt. G. Howieson; A/C.2 F. Hughes; L.A/C. R. H. Jones; A/C.1 H. W. Kavanagh; L.A/C. T. V. Lawrence; Cpl. W. W. McClymont; L.A/C. P. L. Mount; L.A/C. S. Parker; A/C.1 D. J. Phillips; L.A/C. G. E. Strapps.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. N. C. Holdaway; Sgt. R. G. McDowall.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. A. E. Brown; Flt. Sgt. J. A. Bryden; Sgt. K. J. Danks-Brown; Flt. Sgt. T. C. Harris.

WOUNDED OR INJURED IN ACTION.—Flt. Sgt. N. F. Williams.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Sgt. W. R. Berry.

KILLED ON ACTIVE SERVICE.—F/O. T. B. O'Reilly.

MISSING.—Sgt. T. G. Dellar; Sgt. J. E. Fleck-noe; F/O. P. R. Ford; Flt. Sgt. L. T. Little; Sgt. F. G. Phillips; P/O. W. Shillinglaw.

Royal Canadian Air Force

KILLED IN ACTION.—P/O. W. D. Frost; F/O. J. W. James.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. H. J. Fox; F/O. L. F. McRae; Sgt. A. Roy.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. S. D. Banks; Flt. Sgt. B. A. Boyd; Sgt. F. R. Carruthers; Sgt. T. A. Drew; Flt. Sgt. J. A. Duffield; Sgt. W. Y. Emerslund; Sgt. S. Gregory; Sgt. G. E. Miller; Flt. Sgt. R. H. Morgan; Sgt. F. R. Scott; Sgt. R. H. Scott; Flt. Sgt. W. A. Senez; Sgt. C. A. L. Sutherby.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. K. B. Davidson.

MISSING.—Sgt. W. C. Anderson; Sgt. C. R. Andrews; Flt. Sgt. C. J. Challenger; Sgt. D. M. Davis; F/O. T. A. Fillingham; Flt. Sgt. J. Harrington; P/O. R. J. Hunter; Flt. Sgt. N. Kellner; Sgt. A. B. Lewis; P/O. F. L. Milburn; Sgt. E. Moorcroft; Sgt. W. J. Mullaney; P/O. J. G. A. Parry; Sgt. J. P. G. E. Richer; Sgt. T. P. Scandiffio; Flt. Sgt. N. H. A. Taylor.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. H. M. Thompson.

SERVICE AVIATION

MISSING.—Flt. Sgt. D. J. Ashby-Peckham; Flt. Sgt. L. E. G. Bishop; P/O. C. F. P. Brown; Flt. Sgt. W. I. Hansen.

Casualty Communiqué No. 273

Of the names in this list, 96 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. W. C. T. Dempsey; P/O. R. N. Freeman; Sgt. R. K. Hanley; Sgt. G. J. Hanraham; Sgt. E. P. Hansford; Sgt. B. L. May; Sgt. A. W. Reffles; Sgt. K. C. Smart; Sgt. K. E. G. White.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. H. J. Brook; Sgt. R. G. J. Hillyer; P/O. J. S. Lee; P/O. W. May; F/O. J. Towner.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. H. W. Aldridge; Sgt. J. S. Atkin; F/O. J. B. Ayer; Sgt. R. G. Bassett; Act. Flt. Lt. N. A. Bennitt, D.F.C.; Flt. Sgt. J. R. Bird; Sgt. C. Black; F/O. L. Dewhurst; Sgt. C. J. Dupreez, D.F.M.; Sgt. H. Forshaw; P/O. R. J. Goode; Sgt. O. Kedgley; Sgt. D. King; Sgt. G. Leadbeater; Sgt. J. E. Littlewood; P/O. W. R. B. McCarthy; Sgt. R. A. Mansell; Sgt. J. Martin; Sgt. G. F. Medhurst; Sgt. G. A. Morgan; Sgt. D. W. Moss; Sgt. T. C. R. Murlis; F/O. A. M. Murray; Flt. Sgt. J. Myers; P/O. G. P. Neville; Sgt. G. A. Newman; P/O. S. Peel; Sgt. E. T. Prior; Sgt. R. W. Read; P/O. L. T. Ryerson; P/O. T. P. Scanlan; P/O. D. D. Smith; Sgt. N. Spalding; Act. Flt. Lt. A. C. Spencer, D.F.M.; Act. Sgt. D. F. Staton; F/O. A. A. Turner; Sgt. K. G. Walker; P/O. B. N. Ward.

AWARDED D.F.C.: P/O. R. E. Dodd, of 39 Squadron, has completed many sorties, including mine-laying, and has many successful attacks on shipping to his credit.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. I. Barrie; Sgt. W. F. Bradley; F/O. R. B. Capon; Sgt. E. N. Cummings; Sgt. F. J. B. Dukes; P/O. C. B. Fleming; Sgt. G. Glover; Sgt. R. L. Godden; Sgt. A. B. Magill; F/O. J. H. R. St. St. John; Sgt. K. M. Taylor; Sgt. N. M. Turnbull.

MISSING.—Sgt. B. A. Abraham; Sgt. A. S Andrews; Sgt. J. H. Arlow; Sgt. F. J. R. Bain; Sgt. F. V. Barnard; F/O. R. C. Bishop; Sgt. A. W. Booth; F/O. W. H. Boundy; Sgt. E. Bradshaw; Sgt. D. Brown; Flt. Sgt. W. G. L. Brown; Sgt. P. Butterworth; F/O. R. D. Caldecourt; Sgt. J. C. Cochran; Sgt. W. E. Cole; Sgt. R. H. Cramm; Sgt. P. N. Croft; P/O. H. E. Cross; F/O. S. A. C. Cutler; Sgt. J. M. Dalton; Act. W/O. G. W. Darling; Sgt. D. J Davies; Sgt. W. H. Davies; Sgt. E. Dawson; Sgt. R. H. Deacon; Sgt A. Derbyshire; Sgt. D. S. Donaldson; Sgt. G. W. Duffee; Sgt. L. E. Ellingham; P/O. M. P. Ellis; Sgt. N. Ellis; Sgt. N. N. England; Flt. Sgt. C. Entwistle; Sgt. C. W. Falckh; Sgt. M. J. Fitzgerald; Sgt. R. Forster; Sgt. D. C. Foster; Flt. Sgt. F. C. Fray; Sgt. W. G. Garratt; P/O. H. W. Gattiker; Sgt. D. Gillis; Sgt. L. A. Harrison; Sgt. F. G. Hawthorn; Sgt. K. Henson; Sgt. N. V. Hickling; Sgt. S. Hirsch; Flt. Sgt. H. V. Holmes; Sgt. G. Hopkins; Sgt. F. Hugo; Flt. Lt. C. D. Ince, D.F.C.; Sgt. R. Jackson; Sgt. R. O. Jasper; Sgt. D. J. Jones; Sgt. A. C. Keightley; Sgt. J. Kilfoyle; Wing Cdr. R. H. S. King; P/O. R. N. Kinglake; Sgt. R. G. Kingsland; Flt. Lt. L. H. Knight; P/O. H. J. Koller; Sgt. T. E. W. Latter; Sgt. F. Lawrence; Act. Flt. Lt. R. F. MacDonald; Sgt. L. R. McGrath; Sgt. J. J. McPherson; Sgt. F. S. Maltas; Sgt. D. Mann; Sgt. N. Metcalfe; Sgt. S. D. Mindel; Sgt. C. R. Minnos; Sgt. R. A. Muldoon; Sgt. T. Nicholson; Sgt. J. Phillips; F/O. A. R. Porter; Sgt. K. W. Read; Sgt. A. E. Reed; Sgt. W. D. Robertson; Sgt. P. B. Robinson; Sgt. G. E. Rose; Sgt. F. Sanders; Sgt. R. M. Scott; Sgt. A. E. Simmonds; Sgt. C. F. Simons; F/O. A. Smith; Group Capt. W. V. L. Spendlove, D.S.O.; Sgt. A. J. Sutton; Sgt. B. S. Swainston; Sgt. H. C. Thompson; Flt. Lt. F. A. G. Tompkins, D.F.C.; W/O. B. H. Travell; Sgt. E. P. Watson; Flt. Lt. J. S. Watt, D.F.C.; F/O. N. B. Weatherston; Sgt H. J. Wells; P/O. J. C. Wellman; Sgt. L. S. Welsh; Sgt. J. White; Sgt. R. S. White; Sgt. G. Wood; Sgt. A. A. T. Woodard.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Sgt. T. G. Grosvenor; F/O. J. L. Hodgson; Sgt. C. L. Smart.

KILLED ON ACTIVE SERVICE.—Sgt. K. B. Astall; Sgt. W. A. Brettell; Sgt. T. J. Burrington; Sgt. R. T. Cork; Sgt. J. R. P. Dawson; P/O. P. S. Gates; Sgt. R. H. Hanson; Sgt. R. P. Kay; Sgt. A. J. Mills; F/O. W. A. C. Phillips.

WOUNDED OR INJURED ON ACTIVE SERVICE.—F/O. J. C. Hamer; Sgt. B. Z. Lee.

DIED ON ACTIVE SERVICE.—Cpl. C. J. Bullivant; A/C.1 S. T. Carman; Sgt. T. A. Chapman; Sgt. J. Copley; L.A/C. B. E. F. Howard; L.A/C. C. E. Leadbetter; A/C2 F. J. Motts; A/C.1 W. S. S. Sternburg

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. R. K. Banneat; Sgt. D. R. Gilchrist; Sgt. H. F. Grace; Sgt. J. B. Harden; P/O. G. L. John; F/O. D. G. W. Leake; F/O. B. J. McClelland; Sgt. G. B. McCloy; Sgt. J. H. Roden; Sgt. T. D. Shepherd.

MISSING.—P/O. R. H. Geddes; Sgt. H. J. Krohn; F/O. R. B. Meiklejohn; P/O. H. N. Peters; Sgt. R. Shannon; Flt. Sgt. J. B. H. Smith.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Sgt. R. F. Jenkins.

KILLED ON ACTIVE SERVICE.—Sgt. P. M. Clark; Sgt. T. H. T. Lane; Sgt. A. F. Soady; F/O. F. N. C. White.

Royal Canadian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. G. L. Fiddler; Flt. Sgt. F. J. Smith.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. R. J. Ayles; P/O. J. T. Campbell; Sgt. C. A. Carpenter; Sgt. H. S. Cowley; Sgt. R. C. Daoust; P/O. D. Duxfield; P/O. L. L. Garner; Sgt. R. D. Gibson; Sgt. R. R. Gray; Sgt. J. M. S. King; P/O. J. L. P Le Page; Sgt. G. M. Riches; W/O. R. L. Telfer; P/O. V. C. W. Trowbridge; Act. Flt. Lt. J. Whitham, D.F.C.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. W. Lake.

MISSING.—Sgt. J. W. Andrews; Sgt. W. H. Calder; Sgt. A. R. Currie; P/O. B. McG. Gracie; Sgt. J. H. Graham; Sgt. H. D. Heximer; P/O. A. D. Hutchinson; Sgt. R. H. King; Sgt. G. Labuik; Sgt. R. R. Law; F/O. L. F. Lown; Sgt. N. T. Macaulay; F/O. D. S. Milne; Sgt. N. F. Notley; F/O. A. G. Pariseau; F/O. N. D. Reid, A.F.C.; Sgt. A. S. Rhodes; Act. Flt. Lt. W. J. Sibbald, D.F.C.; Sgt. A. J. Sieffert; Sgt. F. O. Turner; Sgt. J. K. Wood.

KILLED ON ACTIVE SERVICE.—F/O. W. D. Graves.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. J. M. Burgess; Flt. Sgt. K. D. Chapman; Flt. Sgt. W. J. Hannah; Sgt. A. W. Jarvis; Flt. Sgt. G. A. Smith.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—F/O. D. A. Adams; Flt. Sgt. T. L. Bowker; Sgt. R. H. Cook; P/O. R. C. Davis; Sgt. W. F. Ensor; F/O. L. J. Fairbairn; P/O. W. H. Gould; Flt. Sgt. O. Haynes; Sgt. A. I. Parkinson; Flt. Sgt. C. C. Piper; P/O. N. Spence.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. B. M. Hirstich.

MISSING.—Flt. Sgt. E. A. Brown; P/O. W. H. Hickson; Flt. Sgt. L. B. McCallum; Flt. Sgt. I. A. Mears; F/O. C. H. G. Redwood.

South African Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Air Sgt. O. Berkowitz; Lt. W. H. H. Brown; Capt. E. N. Colman; Sgt. V. E. M. England; Lt. N. W. Hancock; Lt. H. E. Ironside; Air Sgt. B. Katz; Lt. J. A. Pocock; Lt. W. F. Turnbull.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Lt. E. C. Anderson.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Lt. E. Poretor.